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PROPERTY MANAGEMENT AND MAINTENANCE

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DOCUMENT RESUME

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ABSTRACT

This curriculum guide provides materials for a course that prepares limited English speaking Indochinese adults for entry-level employment in the field of property management and building maintenance. Information on the project that developed these materials is followed by a curriculum outline for the Vocational English as a Second Language (VESL) component. Materials include the program design, a lesson plan for vocabulary development, VESL teaching activities (in recognition, production, and application), and the structures and vocabulary to be taught. The curriculum is divided into 18 chapters. Each chapter contains a lesson plan (teaching materials source, a listing of main concepts to be taught, teaching activities, length of lesson, evaluation), teaching materials, tests, technical glossary, and related general glossary. Topics of the chapters include tools, care of tools and equipment, plumbing repairs, plaster and drywall, redecorating with paint, redecorating with wall coverings, redecorating floors, fasteners and other hardware, door repairs, window repairs, exterior carpentry repairs, ordering lumber and other building materials, cement and tile work, heating systems maintenance, insulation, setting up a workshop, and job skills. (YLB)

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Elk Grove Unified School District

Title: Sacramento County Bilingual Vocational Training Program

Language groups served: Vietnamese, Cantonese

Occupational areas: General machinist
Electronics training
Property management/building maintenance

Length of training: 20 - 30 weeks

Weekly hours of vocational training: 15

Weekly hours of ESL training: 15

Grant award amount: $177,727.

Number of trainees: 100 (during 12 month period)

Approximate cost per trainee: $1,777

Stipends: $20 per month for incentive

Coordinating agencies: Sacramento Employment and Training Agency
and Catholic Social Services Organization

Project Director: LaVina "Dusty" Ward

Address: 8820 Elk Grove Boulevard
Elk Grove, CA 95624

Phone: (916) 686-7712

Project runs until February 28, 1987

G0086 20037

ED048528

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TITLE: Sacramento County Bilingual Vocational Training Program

FUNDING SOURCE: Federal Bilingual Vocational Training Grant

INFORMATION:

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Elk Grove Unified School District
Special Projects Office
8820 Elk Grove Boulevard
Elk Grove, CA 95624

(916) 686-7712

NUMBER OF PARTICIPANTS: 100 Indochinese limited English speakers who are economically disadvantaged.

NEED: In 1986 Sacramento County has over 18,000 Indochinese Refugees, most of whom are on welfare, do not speak English, and have no jobs or job training. At the present time, most adult education and job training organizations offering vocational education classes do not have bilingual aides; therefore, LEP Indochinese refugees in these classes have difficulty learning job skills. Furthermore, though English as a Second Language courses are offered, they are not job specific and often teach more reading and writing than speaking and listening. Another need in Sacramento County is to continue to demonstrate that ESL and vocational programs can be linked together to form an effective bilingual vocational training program that can offer intensive vocational English and job training using mono-English speaking teachers and bilingual aides to explain and clarify concepts being taught to the limited English speaking Indochinese persons.

A. RATIONALE: The program addresses the four major tenets suggested by the California Advisory Council on Vocational Education. These are:

1) Language and cultural barriers must be dealt with in vocational training programs.

2) A flexible approach to linking language and occupational instruction should be used.

3) Complete delivery systems of instruction, program support, and administrative support should be developed.

4) Linkage of public and private sector resources as well as coordinated planning and implementation of programs should be encouraged.

The rational for selecting these four major tenets is that most successful, coordinated programs for adult speakers of other languages in California use this four-point framework. Our current Bilingual Vocational Training Project has also proven this. We coordinate with other vocational training programs in Sacramento County to give maximum opportunities to the LEP Indochinese adult population. Therefore, this project enhances and coordinates existing vocational and ESL educational courses, thus preventing duplication of effort.

B. **PURPOSE:** The purpose of the Sacramento County Bilingual Vocational Training program is to develop and institute a coordinated program within existing institutions of the school district Adult Education programs, Regional Occupational Job Training Programs, and the local colleges to prepare Laotion, Vietnamese and Cantonese persons of limited English speaking/proficiency (LEP) ability to perform adequately in a job environment that requires English skills. This training focuses on General Machinist and Electronics Training in order to fill the critical need for more and better trained persons to work in the new and emerging computer industries that are located or are planning to locate in Sacramento County. To provide more opportunities for refugees, a Property Management and Building Maintenance course is offered.

C. **GOALS:** The goals of the programs are to give the LEP Indochinese refugees **bilingual vocational training, English language instruction** that is **job related, cultural orientation, job search** and **preparation counseling, counseling on work habits** and **attitudes,** and **related support services to ensure success** in employment training and in subsequent employment. The overall purpose of the program will be to train Indochinese refugees for jobs that will fit into electronics or service industries.

D. **SUCCESS OF BVT PROJECTS:** Each year, the Sacramento County Bilingual Vocational Training Project placed more than 80% of the participants in training related jobs. Follow-ups are provided through the BVT Program, on a thirty, sixty, and ninety day basis.

E. **OVERVIEW OF THE PROJECT:** The Indochinese trainees receive Job Related English as a Second Language and Vocational Skills instruction in **Property Management and Building Maintenance** including Entrepreneurship, **General Machinist, Basic Electronics,** and **Microcomputer Repair.** All of these courses are conducted in **both English and primary language to insure comprehension.** The **VESL** program is conducted in English and **stresses listening** and **speaking** and **job related English vocabulary.** English language instruction and bilingual vocational education is conducted daily and is based on assessed needs. **A bilingual job developer/counselor provides support and counseling.** Job related ESL and vocational training is conducted by the Adult Education Department of Elk Grove Unified School District and the Sacramento Regional Occupational Programs (ROP). The vocational teachers are assisted by bilingual instructional aides funded by the project. The **Sacramento Employment and Training Agency** (SETA) provides the support services of the Central Intake Unit (recruiting, advising and assessing). **Catholic Social Services Organization** provides placement services. The job developer assists with recruiting, advising, assessing and placement through the educational organizations. Each trainee may remain in the project for 12 months or until their English and job skills are sufficient to be placed in employment or in on-the-job training (OJT). Trainees are financially supported through federal and state welfare programs coordinated through the Sacramento County Welfare Department. They also receive a small monthly stipend.

An important feature of the program is the SCBVT Advisory Committee consisting of representatives of Sacramento City, County, and service organizations as well as industry and consultants from other bilingual vocational training programs in California.

1. Selection, Initial Assessment, Orientation and Assignment

Applicants for Sacramento County Bilingual Vocational Training (SCBVT) program meet the project participant criteria as follows:

a) Adults who are Vietnamese, Cantonese or Laotian*
b) Limited English proficient
c) Economically disadvantaged
d) Unemployed or underemployed
e) Refugee status
f) Interested in one of the four job training classes and subsequently employment
g) Commitment to fully participate in the training program

*may be male or female, elderly, or handicapped

In initial recruitment, the project uses no formalized or standardized tests since formal testing often intimidates and has a detrimental effect on new trainees. Applicants initially fill out a simple application and speak with the bilingual counselor/job developer who subjectively assesses the applicant's interests and needs. Applicants then receive pre-orientation to SCBVT program and services. Based on their self-perceived needs and interests, and with the aid of job developer/counselor, they select one of the four skill-training courses that includes intensive job related English. Those with previous electronics training and math skills are recommended for the Microcomputer Repair Class. Staff members develop an individual employment development plan which lists all services necessary to make the person job-ready. During the orientation period, the applicant receives support services to eliminate obstacles to job readiness, including information on child care, housing, legal aid, driver's license training and health services. Transportation to job site is discussed and arranged. During the first few weeks, participants are assessed for English and Math skills.

There is a basic math refresher course offered in Cantonese and Vietnamese through Elk Grove Adult Education Program to help potential participants review basic mathematics concepts that are useful in the General Machinist and Electronics courses. If necessary for newly arrived refugees, a three-week American Culture Course is conducted with primary language support offered to acquaint refugees with the essentials of living in American society.

2. Objectives

The objectives of the 12 month program each year are as follows:

1) Within twelve months, having participated in the job related VESL program and the job skills training courses, at least 95% of the participants will complete both courses and demonstrate mastery of at least 75% of the skills presented as measured by criterion referrence tests and teacher's judgement.

2) Within twelve months, having participated in the bilingual vocational training program at least 90% of the participants will be placed in related jobs or training programs leading to full-time employment as measured by employment and other records.

To reach these objectives, the proposed program:

* Uses appropriately trained bilingual staff.

* Uses ROP Bilingual Electronics, Microcomputer Repair, and General Machinists job training classes and ROP Property Management and Building Maintenance.

* Identifies key methodologies, curricula, and techniques used in bilingual vocational training that can be published and distributed to other organizations.

* Integrates ESL and Vocational instruction through the daily VESL class that is coordinated to the ROP job training classes.

* Coordinates with other existing job related ESL and job training courses to bring about effective vocational educational programs for limited-English Indochinese refugees.

* Selects proven and appropriate teaching materials and resources in job related English as a Second Language, literacy, necessary life skills, job skills, and other bilingual vocational training curriculum materials and guides.

* Identifies and contacts potential trainees. Screens applicants to select applicants in greatest need and those who have the most skill potential for completing job training courses.

* Assesses English, math skills, electronic experience, job training needs, and vocational interests of individual trainees.

* Establishes the school district and community linkages necessary for adult Indochinese refugees to acquire basic English and other training to accompany job related ESL and skills training.

* Plans and executes appropriate classes for trainees based on individual needs.

* Broadens existing contacts with agencies providing social and health services.

* Identifies industries, such as electronic and property management/building maintenance companies, to contribute training, materials, equipment, information, and ideas for the training program

* Sets up administrative, budgetary, and evaluation methods.

* Evaluates the effectiveness of the program delivery configuartion both on-going (formative) and annually (summative).

3. Scope of Work Plan

For an outline of the program, see the following table. Classes of 15 to 20 students meet 3 hours per day for job-related English and three hours a day for job training. Job training and VESL classes are held during the day. Students are placed in appropriate levels according to their current proficiency in speaking and understanding spoken English and their literacy needs. Individual participants receive training depending on their level of English, basic education upon entrance into the program, knowledge of electronics, and job training needs. Table outlines the 12 month training cycle and follow-up.

The program staff consists of the following: four six-hour bilingual instructional aides employed to work at job training sites and in the job related VESL program. At each job training site, a bilingual instructional aide works with the ROP vocational teacher. The vocational teachers teach the four job training courses. The full-time VESL project teacher teaches full time the job related VESL classes. To support the program's job training counseling, a full-time bilingual job developer/counselor is hired. The job developer/counselor coordinates the recruitment program, conducts the assessment of the participants, and provides counseling and job development. To keep the program operating and coordinated, there is a full-time Project Director.

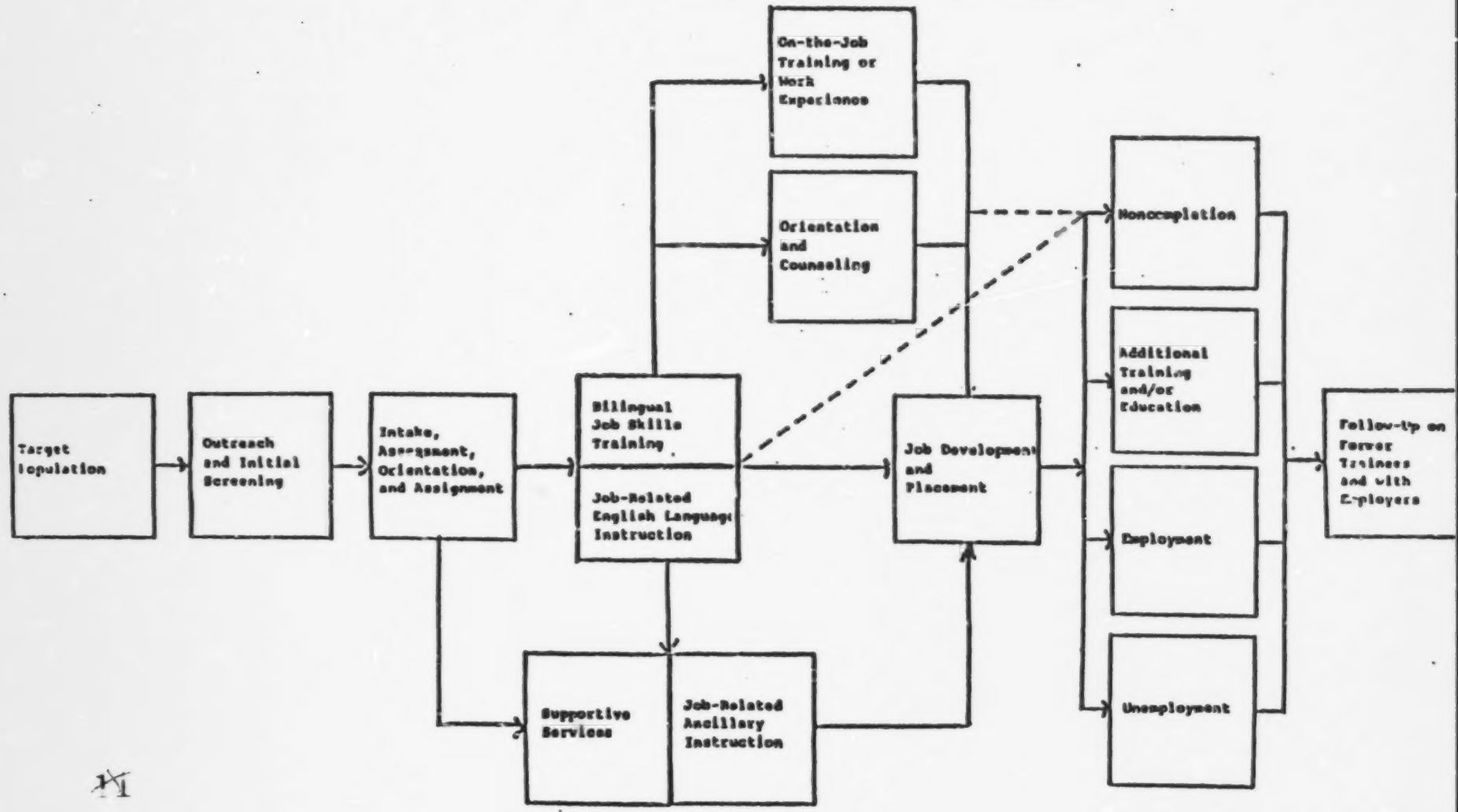
The Elk Grove Unified School District, through the Central Intake Unit of the Sacramento Employment and Training Agency, recruits 75 to 115 project participants during the first months of the project year. The job developer/counselor and the project director conduct the recruitment and outreach program through the school district, Sacramento Employment and Training Agency, newspapers, and presentations to community groups. Other state and federal agencies also notify potential participants; such as, County Welfare Office and California Department of Rehabilitation. Since many Indochinese refugee adults have children attending Elk Grove schools, announcements are made through school bulletins and principal's newsletters. Whenever possible, these announcements are in Chinese, Vietnamese and Laotian languages.

Laotian, Vietnamese and Cantonese women, as well as the handicapped and elderly members of these ethnic groups, are eligible to participate in the Sacramento County Bilingual Vocational Training Project. We currently have several Indochinese women and there are some older adult refugees in the project. We do not have any handicapped refugees; however, our school facilities do provide for this group and they are encouraged to participate.

4. Bilingual Job Skill Training Courses and Job Related VESL

The project focuses on four occupational areas: Property Mangement and Building Maintenance, General Machinist, Basic Electronics, and Microcomputer Repair. All job training courses are offered through the Sacramento County Regional Occupational Program (ROP). The following is a description of each of these courses. Each course is at least 500 hours of instruction carried over a 30 week period by certificated Engligh speaking vocational teachers using bilingual instructional aides (Vietnamese, Laotion or Cantonese) to provide primary language explanation of terms and concepts.

TRAINEE FLOW IN A BILINGUAL VOCATIONAL TRAINING PROGRAM



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Both the job training classes and the accompanying job related VESL courses are 3 hours in length, offered at times during the day, and at locations convenient to the Indochinese Refugee communities in Sacramento. Transportation is arranged by the participants. Carpooling is encouraged.

Trainees are referred to job skills training classes when it has been determined by assessment and counseling that the trainees have sufficient language and work potential to succeed. NOTE: Though job skills classes are bilingual, it is important the the trainees have sufficient survival English and basic mathematics skills.

The primary purpose of the vocational training program is to provide entry-level job skills. Since trainees are limited proficient, it is critical that the job training utilize their primary language for conceptual explanation and clarification. Since most of the current vocational instructors are mono-English speaking, the project provides bilingual instructional aides to assist vocational teachers. The vocational instruction is completely individualized. The classes are open-entry/open-exit, and students generally work at their own pace.

Vocational instruction is competency-based. The vocational instructors have a competency checklist and progress chart for each student. See attached skill sheets. Student's progress is measured by observing task performance, and in some skill areas, by workbook exercises. Teaching approaches include lecture and discussion, demonstration, and especially hands-on practice. Bilingual instructional aides are used to help students better understand concepts. Vocational instruction and language instruction are coordinated through a joint evaluation team as needed. The vocational instructors, the VESL teacher and the bilingual job developer counselor review student progress. This team reviews the instruction needs of the students and determines the coordination among instructors and support staff necessary to provide these needs.

The English speaking vocational teachers employ second language acquisition methodology to enable the limited English proficient student to better understand the concepts presented in English. Of course, the concepts also are taught in the primary languages of Cantonese, Vietnamese and Laotian following the English lecture. The second language methodologies used to help the LEP student grasp more English are as follows:

1) Employ comprehensible input in teaching subject matter in English, i.e. teachers use objects, pictures, and diagrams to explain concepts in English. This is called Total Physical Response.

2) To further help the LEP student, the English-speaking vocational teacher speaks slowly.

3) Since sometimes in concurrent translation (concepts explained in second language) LEP students "tune out" the explanation in the weaker or second language, the English speaking vocational teacher employs active listening techniques such as outlines on the board, overhead transparencies, and questioning strategies. Overall, there is a real effort to get the LEP students to understand the concept and vocabulary in English. The bilingual instructional aide provides the primary language equivalents for any difficult terms and explains in the primary language the meaning of the concpets being taught in English.

4) Though the initial vocational instruction is delivered primarily through the participants native language, there is a gradual increase in the amount of English that is used. Of course, the vocational instructors are sensitive to the levels of understanding and are careful to always remain flexible and use their bilingual instructional aides to explain concepts when needed.

5) The Advisory Committee which represents the electronic and service industries make valuable suggestions to the content of the job training courses, and are closely involved in the program.

PROPERTY MANAGEMENT AND MAINTENANCE

This course prepares for entry-level employment in the field of Property Management and Building Maintenance. Students completing a class in Property Management and Building Maintenance will acquire several skills to enhance their employability. They will have multi-skills training in a variety of building and repair areas such as simple plumbing and electrical. The training lays ground work for the following: building superintendent, property manager, hotel and restaurant housekeeping; property rental agent, apartment house manager, building maintenance worker, and building custodian. As a part of the course, participants will receive training in entrepreneurship.

WHAT WILL BE LEARNED

The student will receive instruction in the essential areas of property management and building maintenance. Specifically, the student will learn maintenance and repair; property supervision and management; rentals management; carpentry; plumbing; electricity; exterior and interior maintenance; use of chemicals; painting and decorating; floor cleaning and finishing; roof repair and caulking; glazing; grounds and shrubbery care; overview of basic business practices; receipt of payment; inventory of properties and needed repairs; contracting of services and supplies; and collection practices. This training will be conducted by the ROP Vocational Teacher.

In addition, the student will learn job-seeking skills such as resume writing and interviewing techniques which will help to get a job. Students will also learn how to keep jobs once they get one. This training will be conducted by the ROP Vocational Teacher.

Specific skills taught are indicated on the following page.

VOCATIONAL ENGLISH AS A SECOND LANGUAGE

The goal of Vocational English as a Second Language (VESL) is to prepare participants for employment by teaching listening, speaking, vocabulary, reading, and writing skills directly related to the job training in which they are participating. This course emphasizes language, listening, and speaking skills needed to obtain or retain the job.

Vocational ESL begins with a review of the contexts and tasks of the job and assesses the appropriate linguistic skills - listening, speaking, reading, writing and cultural - needed to function in that job. Performance objectives are determined by reviewing vocational training texts, interviewing vocational trainers and supervisors, and gathering on-the-job language data.

WHAT WILL BE LEARNED

Vocational ESL requires the integration of vocational and linguistic objectives. Students learn linguistic skills necessary for finding and getting a job, keeping a job, and advancing in a job. These linguistic skills are taught in the context of the vocational skills necessary for successful functioning on the job. The most important structures and vocabulary that must be understood or actively used in the job are identified and learned. Additional insight comes from interviewing limited English speakers currently working in the field. Specifically, students will learn how to do the following:

- Find a job and complete an application.
- Handle a job interview.
- Ask and follow directions and commands.
- Discuss work with fellow workers and employers.
- Talk about the tools and materials used in the job.
- Understand and be able to talk about some of the various methods and procedures required by the job.
- Use technical manuals, textbooks, catalogs, and other reading material used in the job.
- Explain what he or she has done or is doing.
- Complete order forms, bills, time cards, health and insurance forms.
- Understand and talk about safety and health.
- Seek clarification or help when needed.
- Socialize with fellow workers and employers.

In order to be able to perform the above actions, participants will acquire the specific vocabulary used on the job: the names of tools, instruments, procedures, processes, requirements and duties, health and safety terms, and general terms of measurement. They will learn the vocabulary required for their vocational training program, which is being taught (at least partially) in English, and they will also acquire a general core of "survival" vocabulary needed for the job. This class is taught by the project VESL Teacher.

Note: The vocational ESL course is in addition to the basic ESL program. The basic ESL program is offered by various Adult Education Departments and all students are encouraged to enroll in ESL classes.

5. **Cultural Orientation**

The SCBVT program provides cultural orientation as an ongoing part of the program. Many Indochinese students have values about time, career choices, hygiene, and social mobility that contrast with U.S. values. Bilingual staff members explain these differences to participants, stressing what is expected by employers, at interviews, and on the job. A wide range of cultural values are discussed in order to lessen their interference with vocational training and employment. The film, AMERICAN SOCIAL BEHAVIORS: SOURCE OF CROSS CULTURAL MISUNDERSTANDING (Alexander, VA., Washington International Center of Meridian House International) is used.

6. **Job Counseling, Placement, and Follow-up**

The SCBVT provides comprehensive job counseling placement through the Catholic Social Services Organization. The job counseling is provided by the bilingual job developer/counselor and the VESL teacher. Job counseling fosters job search-and-readiness skills, work habits and attitudes, and emphasizes the expectations that employers have of their employees. The bilingual job developer/counselor supplements the classroom counseling with a range of activities, including individual sessions, small group work, industrial site visits, and presentations by employers, former students, and Indochinese persons who now work in business and industry. Participants also receive information about career options in their field of training at the local high school career centers at local colleges.

The bilingual job developer/counselor provides job identification and development, job referral, and follow-up services. The bilingual job developer/counselor informs participants about dress, behavior, and communication techniques. The project emphasizes pre-interview preparation training. As part of the VESL training, participants learn how to find a job, fill out an application, read want ads, and interview.

Follow-up occurs 30, 60, and 90 days after the close of the project. At this interval the bilingual job developer/counselor contacts former students to find out how they are progressing as well as collects information for the SCBVT project records.

7. **IHE Linkage**

The Los Rios Community College District works closely with the Sacramento County Regional Occupational Programs. The ROP Programs are the intermediate step between high school and college. Thus, the job training programs for the Indochinese Refugees help develop their basic skills, job aptitutdes, and confidence to attempt more advanced training at the college level. The Electronics course is equivalent to the first year electronics course at American River College. Through the SCBVT, refugees can acquire credits for this first year college course. The Los Rios Community College District is very supportive of the SCBVT and the work that is being done to prepare refugees for college and/or jobs.

8. **PIC Linkage**

The Private Industry Council (PIC) is kept informed of the SCBVT. The PIC is involved in most of the vocational projects in Sacramento County, such as VEA Title II and Targeted Refugee Assistance Programs. The PIC was involved in the planning of this project. The PIC meets regularly at Sacramento Employment and Training Agency. Progress reports are given by the Project Director to keep the PIC abreast of the Bilingual Vocational Training Project.

9. **Additional Support Services**

Other SCBVT support services include personal counseling, information on legal services, driver's license training, child care information and individual tutoring. All services can be provided in the trainee's primary language, since the project staff is predominately bilingual. Local social service agencies provide specialized personal counseling and day care services (Head Start) through referral linkages.

Trainees will receive a small stipend which amounts to $20.00 per month while in the project. This stipend is meant to encourage participants to attend both job training and VESL classes regularly. In the past, we found that this stipend acted as an incentive award for regular attendance and has been used as such.

Another support service is a bimonthly newsletter printed in English, Cantonese and Vietnamese. This newsletter has information about community service, job hints, American cultural ways, and other topics appropriate for the project.

PROPERTY MANAGEMENT AND MAINTENANCE COURSE OUTLINE

PROPERTY MANAGEMENT & MAINTENANCE

CHAPTERS

1.	TOOLS	2 weeks
2.	CARE OF TOOLS AND EQUIPMENT	2 weeks
3.	PLUMBING REPAIRS	2 weeks
4.	PLASTER AND DRYWALL	2 weeks
5.	REDECORATING WITH PAINT	1-2 weeks
6.	REDECORATING W/WALL COVERINGS	1 week
7.	REDECORATING FLOORS	1-2 weeks
8.	FASTENERS AND OTHER HARDWARE	1-2 weeks
9.	DOOR REPAIRS	2 weeks
10.	WINDOW REPAIRS	2 weeks
11.	EXTERIOR CARPENTRY REPAIRS	2 weeks
12.	ORDERING LUMBER & BUILDING MATERIALS	1 week
13.	CEMENT AND TILE WORK	2 weeks
14.	BASIC ELECTRICAL REPAIRS	2-3 weeks
15.	HEATING SYSTEMS MAINTENANCE	1-2 weeks
16.	INSULATION	1 week
17.	SETTING UP A WORKSHOP	1 week
18.	JOB SKILLS	1 week

Home Maintenance Textbook, William Weiss,
Bennett & McKnight, Glencoe Publ. Co.,
Encino, CA., 1983.

VESL

V E S L Curriculum Outline

VESL Curriculum Outline

A. VESL Program Design

B. Lesson Plan for Vocabulary Development

C. VESL Teaching Activities

1. Recognition Teaching Activities

   a. Repetition drill
   b. Substitution drill
   c. Variation drill

2. Production Teaching Activities

   a. Dialogue
   b. Speech
   c. Pair drill
   d. Communication grammar

3. Application Teaching Activities

   a. Total Physical Response
   b. Reading and writing using context clues

D. Specific work and Social Language Vocabulary from which specific structures may be chosen for each VESL lesson. (refer to number)

A. VESL Program Design

A. VESL PROGRAM DESIGN

In setting up our vocational-ESL courses, we chose a program that is generally considered the most effective vocational ESL disign. Our program combines VESL with bilingual vocational education. The students receive 3 hours a day of vocational training with a bilingual aide to explain difficult concepts in their own language. In addition to this course, there is a 3 hour job-related ESL course which consists of English for the vocational classroom and the workplace. Students who speak only limited English can begin vocational training immediately by receiving training in their own language and English for their future job. At the beginning of the course students receive heavy support in their own language to make certain they understand the basic concepts of the vocational course and to give them enough success to feel confidence. Gradually this support is taken away until the students are able to function almost exclusively in English. Regular meetings between the VESL and vocational instructor are essential to the success of this program.

The following techniques have been followed by our program:

1. Careful and in-depth planning
2. Careful needs assessment of job-market needs of the prospective trainees
3. A staff that is bilingual and committed to the success of the trainees
4. In-service training for staff
5. Personal and job counseling for the trainees
6. Full-time staff
7. Cross-cultural training in American culture, especially in American employment practices for trainees
8. Bilingual vocational instruction closely coordinated with the ESL instruction.
9. ESL instruction that is job-related and closely coordinated with vocational instruction
10. An advisory committee with representatives from minority community, the vocational skills area and the employment sector
11. Follow-up services for trainees who have completed the program and joined the work force. (Friedenberg p. 10)

The VESL curriculum of our BVT Program was drawn from a needs assessment of the classroom needs and the job world. During the first 3 months most of the time was spent on classroom subject matter because if the students couldn't understand what was happening in the classroom, it would be impossible for him/her to develop skills needed to survive in the job world.

After that, job getting, keeping and moving ahead skills were emphasized. In determining lesson content, the following steps are suggested:

1. Determine vocational topic, i.e. magnatism, electronic components, filling out application forms.
2. Determine the vocabulary, especially technical. Separate the vocabulary needed for recognition and from the vocabulary needed for speaking. Each category can be taught differently. REMEMBER, TEACH THE STUDENTS WHAT THEY WANT AND NEED TO KNOW.
3. Determine any grammar structures that need to be practiced for clear communication. Don't teach grammar rules for their own sake. If grammar is taught, teach it in a communicative way related to a vocational subject.
4. Determine the language functions needed for speaking.
5. Observe pronunciation problems that impede comprehension of message.
6. Determine the cultural behaviors that are different from American behavior because these differences may cause problems on the job site. Some of the problems that we learned about through our students were as follows:
   a. Not asking questions when they didn't understand.
   b. Bringing friends to the work site.
   c. Working during break.
   d. Relations with supervisors and American peeers.
   e. Isolating themselves from American workers.
   f. Interpreting a reprimand as a dismissal.
   g. Business decisions taken personally as rejection.
   h. "Cooperation" in tests or in work place where individual ability is necessary.

B. Lesson Plan for Vocabulary Development

B. LESSON PLAN FOR VOCABULARY DEVELOPMENT

Each Job Training Lesson contains Technical and General Vocabulary. The following format is used to teach this vocabulary immediately after vocational lessons. The student demonstrates understanding (listening), speaking, reading, and writing skills using the technical and general vocabulary. For specific VESL teaching activities, see Recognition Teaching Activities, Production Teaching Activities, and Application Teaching Activities.

RECOGNITION

1. The teacher presents vocabulary (terms) clearly and slowly. Use actual equipment or tools whenever possible. Do not write vocabulary on board at this stage.
2. Students answer simple comprehension questions using yes-no response.

PRODUCTION

3. The teacher models key terms in a sentence to demonstrate how vocabulary is used. Ask students alternative or descriptive questions to elicit choice or descriptive answers.
4. Put students in pairs. S1 asks S2 using vocabulary, S2 answers. Reverse S2 asks, S1 answers.

APPLICATION

5. Write vocabulary (words) on board and explain again.
6. Have students read vocabulary list and do a reading-matching exercise.
7. Using context clues, have students fill in blanks using vocabulary.
8. Dictate vocabulary. Students write words. Check for comprehension.
9. Next day, give oral vocabulary test followed by written test.
10. Use total Physical Response Activities to check vocabulary comprehension and production.

C. VESL Teaching Activities

1. Recognition Teaching Activities

RECOGNITION TEACHING ACTIVITIES

DRILL FOR TEACHING SENTENCE STRUCTURE, VOCABULARY AND EVERY DAY LANGUAGE.

A. TEACHING REPETITION DRILLS

1. Model the item (word, phrase, or sentence) twice, having the students listen.
2. Model the item again, having students repeat chorally.
3. Model the item for each student as they repeat individually.
4. Model the item again as students repeat chorally.

If a student has difficulty, we backward build up. Have him/her begin from the end of the sentence and repeat increasingly longer segments of the sentence until the entire sentence is mastered.

EXAMPLE: I calibrate the volt meter.
meter.
volt meter.
the volt meter.
calibrate the volt meter.
I calibrate the volt meter.

B. TEACHING SUBSTITUTION DRILLS

1. Model the basic sentence twice, having the students repeat chorally.
2. Roll-play the substitution.
3. Drill the substitution individually.
4. Drill the substitution chorally again.

EXAMPLE: Go get the volt meter.
soldering iron.
screw driver
wires.

C. TEACHING VARIATION DRILLS

1. Teacher models item as phrase or sentence to have students generate different sentence patterns.
2. Students transform phrase or sentence items into questions. (interrogative sentences)
3. Students transform phrase or sentence items into commands. (imperative sentences)

EXAMPLE:

1. Teacher: Thanh calibrates the volt meter.

   S1 asks: Does Thanh calibrate the volt meter?

   S2 answers: Yes or no.

S1 asks: Who calibrates the volt meter?
S2 answers: Thanh does.
S1 asks: What does Thanh calibrate?
S2 answers: The volt meter.

2. Teacher: Le has the soldering iron.
S1 says to S2: Please get the soldering iron!
S2 says to S1: Solder the chips!
S1 says to S2: Be careful! Don't drop the soldering iron!
S2 says to S1: Watch out! The soldering iron is hot!

2. Production Teaching Activities

PRODUCTION TEACHING ACTIVITIES

A. TEACHING A DIALOGUE

A dialogue is a short conversation between at least two people. It is an excellent method for teaching everyday expressions and useful conversation. To be effective a dialogue should be lively, have fairly short sentences and useful language structure or expressions. Remember to make dialogues as true to life as possible. Use realistic props and actions. Students will remember words and expressions better if you use audio-visual and kinesthetic aids to help them learn. Also, remember to use hand signals to direct group participation. Always teach, beginning with large group, then small group and finally call on individuals when you feel certain they will succeed. (Mouth words).

Process for Teaching a Dialogue:

1. Give a brief introduction of the content of the dialogue. Improve your explanation by using audio-visual or kinestic aids as drawing pictures on the board or using gestures.
2. Act out or read through the dialogue dramatically.
3. Teach 2 lines at a time. Use gestures to help students learn.
   a. line 1 - teacher models twice alone, students repeat twice.
   b. line 2 - teacher models twice alone, students repeat twice.
   c. lines 1 & 2 acted out by teacher and students. Teacher is A and students are B. Exchange roles. One group is A, second group is B.
   d. Students practice lines 1 & 2 in pairs for a few minutes.
   e. Call on individuals to play parts in seat.
4. Learn lines 3 and 4, steps a-e.
5. Lines 1,2,3,4 acted out by teacher and students. Teacher is A and students are B. Reverse roles.
6. Students practice lines 1, 2, 3, 4 in pairs.
7. Seated role play.
8. Stand up rile play.

If at any time the students are having difficulty remembering their lines, you must provide supportive learning. Return to repetition part of learning until they are sure of themselves.

Alternate Method for Teaching Very Large Classes

Break large group into groups of 10. Chain drill instead of practicing in pairs.

EXAMPLE:

Bob: Hey Bao. Go get the drill and give it to me.
Bao: Excuse me. Please repeat that slowly.
Bob: I said, "Go get the drill and give it to me."
Bao: Now I understand. Thanks.

B. SPEECHES

To give students confidence in speaking English in front of a large group of people, students gave short speeches from time to time. Subjects ranged from topics of general interest to technical. Because of the students varying ability in English, a structured sample was prepared using the language experience method. The instructor often asked a series of sequential questions to the class. The answers given individually to students were put together into a concise paragraph that explained the subject. The paragraph explained the subject in the students' own language. It was used to teach stress, intonation, phrase reading, pronunciation and oral reading. The following day the lower ability students gave a speech on the same topic using any vocabulary and structure they liked from the class's model. The more advanced students gave a speech on the same topic but used their own language. The steps used are as follows:

1. Instructor asks a question.
2. One student answers it.
3. The instructor writes the answer on the board.
4. This procedure is followed until the paragraph is finished.
5. Instructor reads the paragraph to the class.
6. Stress is written in.
7. Students chorally repeat each sentence after the instructor. (two times)
8. Students read paragraph in pairs several times.
9. Several students read paragraphs individually to the class.
10. The following day students give speeches on the same topic.

Sample Lesson - How to Measure Current

Questions asked to individual students.
1) What is current?
2) What do you use to measure current?
3) What is the basic unit of current?
4) How do you measure current with an ampmeter?
5) What is the last thing you do?

PARAGRAPH WRITTEN COOPERATIVELY BY CLASS

Current is the flow of electrons through a conductor. An ammeter is used to measure current. The ampere is the basic unit of current. To measure current interrupt the circuit and connect the positive terminal of the ammeter to the positive terminal of the power source. Then you connect the negative terminal of the ammeter to the negative terminal of the power source. Read the scale of the meter to know how many amperes you have.

This is an excellent method to use with class when the instructor lacks knowledge about the topic. The instructor asks and students answer. Often argument over the correct answer takes place between students in English. The instructor does not have to feel totally expert in the subject matter.

C. PAIR WORK

The best way to improve English speaking ability is to give the students opportunities to speak. Due to the numbers of students in a class, it is difficult to give each student much individual time to practice. One of the best ways to overcome this problem is to devise speaking practice in pairs. The following example is a pair practice that combines the grammar lesson of count and non-count nouns with the subject matter of electronic components. Use any combination of vocabulary terms and simple grammatical structures.

EXAMPLE - Oral Practice (practice in pairs)

How much, many
a little, a few

QUESTION	ANSWER
How much _____ is required? How many _____ are required?	2 _____s are required. 3 Just a few. or Just a little ____ is required. A lot of

---

Fold your paper in half
You ask the question.

1. resistors - 2
2. electrons -3
3. switches - 5
4. resistance
5. time
6. watt - 7
7. power

You answer the question

1. resistors - 2
2. electrons - 3
3. switches - 5
4. resistance
5. time
6. watt - 7
7. power

8. energy
9. ampere - 10
10. multimeter - 6
11. voltage
12. current

8. energy
9. ampere - 10
10. multimeter - 6
11. voltage
12. current

D. COMMUNICATIVE GRAMMAR

You can further improve your students' listening and knowledge of correct verb tense by asking questions about the commands they have learned. Remember to model answers first so they will feel secure. The three kinds of questions you can ask are as follows:

1) Yes/no questions
2) Choice questions
3) Information questions

EXAMPLE

Command Go get the drill.

	QUESTION	ANSWER
Yes/no	Am I getting the pliers?	No, you are not.
Choice	Am I getting the pliers or the drill?	You're getting the drill.
Information	What am I getting?	You're getting the drill.

Bizarre questions will make them pay attention.

Am I getting the drill or taking a bath?

Verb tense

Examples for asking questions:

Simple present .

Hai, put the soldering iron away.

Hai puts the soldering iron away everyday.

1. Does Hai put the soldering iron away everday?

   Yes, he does. or Yes, he puts it away everyday.

2. Does Hai put away the soldering iron or the PC board everyday?
3. Who puts away the soldering iron?
4. What does Hai put away?

3. Application Teaching Activities

A. TOTAL PHYSICAL RESPONSE

When you want a clear, direct methodology to teach your students to understand you when you give them commands or describe a process, use the Total Physical Response method (TPR). Students learn to understand and use vocabulary acting out commands and utilizing the senses of sight, hearing and touching. TPR is based on the theory that listening comes before speaking. Students must do a lot of listening before they easily recognize what they are hearing. Once they hear something with ease, they can repeat it.

The methodology also incorporates the idea that through the use of commands and simultaneous physical action, student learning is improved.

GENERAL TEACHING STEPS FOR VOCATIONAL TPR

1. Teacher models whole process 2 times.
2. Teacher models 3 commands at a time. (2 times) Use volunteers to model with you if you like.
3. Students respond to teacher commands with teacher as a model. (large group, small group, individual)
4. Students obey commands without the help of the teacher. (large, small, individual).
5. Students repeat the commands after you as you model action.
6. Teacher does the action and students give the command in chorus.
7. Teacher does the action, students give the command and teacher writes the command on the board. Students copy the commands.
8. Students repeat commands after instructor.
9. Students practice the commands in pairs.
10. Individual students give the commands to the class.

B. READING AND WRITING USING CONTEXT CLUES

Place the following words in the correct place.

hide	use	common sense
damaged	borrow	mistakes
obey	copy	injuries
workstation	report	run sweep
right place	clean	hoard
can you help me?	horseplay	accidents

1. Walk in the classroom. Don't _____.
2. No _____.
3. Keep your _____ in order.
4. Use your tools. Don't _____.

B. READING AND WRITING USING CONTEXT CLUES (continued)

5. Put your tools back in the _____. Look at the numbers.
6. Keep classroom _____.
7. _____ the room when it is dirty.
8. _____ Mr. Thompson's rules.
9. Don't _____ parts. Return what you can't _____.
10. When you don't understand Mr. Thompson, go to him or the aide and ask, "_____".
11. Do not _____ answers from other students. When you _____, you do not learn.
12. Report _____ and _____ to the instructor.
13. _____ _____ to the instructor. Don't hide.
14. Report _____ tools to the instructor. Don't _____ them.
15. The best rule is always use _____.

STRUCTURES AND VOCABULARY

Function (The Student Can:____)	Structures & Vocabulary	Materials/Notes
Basic skills		
Recite the alphabet		
Count by 1's, 5's, 10's to 100, 1000		
Work Language		
multi-digit		
1.1 read numbers (handwriting, typeset, printout)	56135 = 56-135 or 5-6-1-3-5 or 56-13-5	parts, notes, printout forms
1.2 ask for clarification of poorly printed no's.	Can you help me, please? What's this number?	
1.3 read no's. arranged in rows/columns	The first number is_____. The first number in the second row is_____. The last number in the third column is_____.	
1.4 count parts in containers	S1 How many do you have / are there in that___? S2 I have_____. There are___in this____.	bin, bucket, basket, bag, envelope

* Throughout this curriculum S1 refers to Speaker 1 for S2 to Speaker 2.

Function (The Student Can: ___)	Structures & Vocabulary	Materials/Notes
1.5 verify the count	S1 Check the count on these.	envelope with paper clips inside.
	S2 It's O.K. short/shy over	tags outside indicating number of parts
	S1 How many short/over?	
	S2 _____extra more short shy	
1.6 sign-off or bug-off on something	stamp/bug the card	stamp
	sign the card	
	initial the card	
	Would you please, _____	
1.7 sign-off in a specific location	stamp the card in the	
	upper/lower right/left	
	corner, in the middle/center	
	of the circle	

Function (The Student Can:___)	Structures & Vocabulary	Materials/Notes
1.8 Indicate where something has been stamped off.	S1 Does it have a stamp? signature initial S2 Yes in the _____.	cards as in 1.7 already stamped
1.9 Put things away	Put these {bins / envelopes / etc} on the top shelf. bottom shelf in the middle. middle shelf on the right. middle shelf on the left.	Shelves ...then ditto a hand-out to practice shelving.
1.10 Tell where things are	S1 Where are the bin? S2 On the top shelf etc.	
SOCIAL LANGUAGE		
1.11 Identify him/herself	S1 What is _____? What's your name? S2 My name is_____. Call me_____. How do you spell___?	discuss nicknames
1.12 Correct someones pronunciation/ spelling of his/her name.		
1.13 Identify his/her dept. & dept. no's.	I work in (name)_____. That's (number)_____.	

Functions (The Student Can: ___)	Structures & Vocabulary	Materials/Notes
1.14 Introduce him/herself	Hi! Hello! I'm_____. or My name is_____. I work in _____.	
1.15 Introduce others in a room	This is _____. That is_____. Over there is_____. _____is over there. The woman on the right is_____. on the left in the middle *next to * behind * with the glasses in the blue sweater _____is on the right etc.	
1.16 Identify another person by describing physicial appearance.	S1 Do you know_____? Who is_____? Who's your supervisor? S2 ____is. Do you know her/him? No. What does s/he look like. S1 S/he is tall/short old/young about 30/40 thin/medium stocky pretty (adj) e.g. pretty tall, pretty thin kind of	. Milk and Honey, p.31-5 . Students describe other students . Pictures of leads, production managers, J. Beatty, Ron Beamer etc.

MORE NOTES: Additional Exercises

To expand Functions 1.1 - 1.10 ask students:

What are you doing?
What did you do?
(vary with she/he, etc.)

READING/WRITING: Ask students to read the information on their ID. cards, deleting names. Have other students guess which card goes with which classmate, from the descriptions. If no ID cards then do the exercise. have students write their own.

Function (The student can:___)	Structure & Vocabulary	Materials/Notes
BASIC SKILLS		
Identify colors and shades of colors.	brown, black, orange, red, yellow, violet/purple, gray/silver, white light/dark shin/dull or flat	Color wheel with spinner old new/coins as paint cards
WORK LANGUAGE		
2.1 Follow single step commands	bend-_____ insert twist_____ untwist hook_____ unhook wrap around straighten wind remove/take out coil uncoil tight loose right-side-up upside-down	wires pipe cleaners colored yarns/wools
2.2 Repeat instructions to indicate acknowledgement.	S1 Wrap the wire around the pen. S2 OK, Wrap it around the pen. like so like this. this way.	S1 Demonstrates action/ directions. S2 Performs action, repeating direction to indicate acknowledgemer

Function (the student can:____)	Structure & Vocabulary	Materials/Notes
2.3 Clarify directions in a process (brushing your teeth)	S1 Remove the cap. S2 cap ? S1 Yes, this is the cap. Squeeze the tube from the bottom. S2 Squeeze? What's that? S1 Yes, like this. Squeeze. S2 lay the toothpaste on the brush. S1 "Did make a mistake?" S2 "What's wrong?" S2 "What should I do now?"	toothbrush, toothpaste S1 should try to use some unusual terms to get S2 to clarify their meaning. Explain before hand that S2 is going to do this and that S1 should clarify and new words. At the end of the exercise review clarification techniques/question.
2.4 Repeat instructions to acknowledge them.	S2 Watch me do it now. S1 OK! S2 Remove the cap, like so. Squeeze the tube.	This function reviews 2.2. It also points to the fact that students can learn some language on the job by trying to use terms/expressions that native speakers have just used. Do this with one or two students to make this point. Then list out any vocab. students want to learn, let students pair-up & practice as an ESL operational drill.

Function (The student can:____)	Structure & Vocabulary	Materials/Notes
2.5 Follow color-linked directions.	S1 Bring me red wires. Bend one red one in half. Twist the ends together Wrap another red one around your finger. Insert the other red one into this hole. (To vary use 4 wires-add one of the other red ones.)	Photo board wires . Direct a student. Explain you'll say it once and that she'll have to clarify, slow you down or whatever. .Have students pair up and practice .Teach structures explicitly
2.6 Understand & respond to interruptions.	S1 What are you doing now? S2 I'm bending wires. winding etc. S1 How many are done? S2 ____. S1 Do that one, one more, after that one, then two more, stop. S2 All right.	S2 is given a bag of wires and is doing something to them. S1 is given a piece of paper telling how many wires are needed. S1 interrupts S2 and redirects her At the end, S1 shows S the paper.
2.7 Identify common tools.	S1 What's this? S2 It's____.	Emphasize pronunciation of tools used in assembly area. If possible get different types of some tool, e.g. a big/small tweezers (red hdle blk. hdle, needle nose).

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Function (The student can: ___)	Structure & Vocabulary	Materials/Notes
2.8 Ask for/locate tools.	S1 Did anybody see my_____? use borrow S2 It's right there/over there on the shelf. S1 No. I have another one too. That's my small tweezer. I'm looking for the big one. or Thanks! That it's.	Ask student to leave room. Remove one tool. Let the class put it somewhere. Tell student to return.
SOCIAL LANGUAGE: 2.9 Describe his/her daily routine.	Simply present tense. Include: drive, carpool or take the bus to work, arrive at work, work until, take a break, return to work, stop for lunch, go back to work.	
2.10 Ask and answer questions about daily work.	Frequency adverbs-every, always, usually, sometimes, seldom, rarely, never. Do you ever_____? Yes, _____. No, _____.	

MORE NOTES: Additional Exercises

- To give further practice to 2.3, 2.4 pick another operation using verbs,such as, squeeze, remove, lay, adverbs like gently, firmly (e.g. using a glue).
- To practice reading. Read bottle tops, packages for single-step instructions.

MORE NOTES: con't.

* To further practice 2.9, 2.10:

practice: before earlier than
after later than

a. Draw a story square about two workers.

	starts work	goes home
Jan	6:30	3:00
Jane	6:45	3:15

b. Role play - Your friend is thinking of coming to work at ELDEC. She has never never worked in a flex-time company. Explain what you usually do; how flex-time can be useful if you have an emergency or a late night party.

Let your friend clarify anything she doesn't understand.

c. Write and read work schedules.

d. Read an activity schedule from Echo Newsletter.

FUNCTION (The student can:___)	Structure & Vocabulary	Materials and No .
BASIC SKILLS		
Calculate length of time		
Use/convert fractions to decimals	1/4, 1/2, 3/4 .25, .50, .75	
WORK LANGUAGE:		
3.1 Follow instructions for a new process. (Making a paper hat.)	1. Fold the paper in half with the edge up. 2. Fold the paper from left to right. 3. Unfold the paper, leave a line down the center. 4. Bring the top left corner to the center line. 5. Bring the top left corner to the center line. 6. Fold the bottom rectangular piece up. 7. Turn the hat over. 8. Fold the other bottom piece up. 9. Try on the hat to see if it fits.	paper squared off Instructor shows class one hat. Asks for a volunteer. Tells student she will both demonstrate and direct student in making hat. Student works alongside the instructor, clarifying, acknowledging terms.
3.2 Do a new process immediately after having had it demonstrated.	First then next What next? What now? Show me again.	Students try to make hats and talk their way through the process.
3.3 Read a simple diagram to do a process		origami
3.4 Direct someone else using a diagram.		origami

FUNCTION: (The student can:___)	Structures & Vocabulary	Materials/Notes
3.5 Follow a procedure to assemble something.	S1 1. Insert the end of the hose here. Rotate it clockwise until it locks. 2. Join the metal extension wands. Depress the locking buttons of one wand and push this into the other. 3. Push the assembled wands into the floor nozzle. Align the wand hole with the button on the floor nozzle. 4. Push the curved want into the straight wands. Aligh them.	Cannister vacuum
3.6 Follow a procedure for taking something apart.	5. Depress Detach/take off Counter clockwise pull out	Cannister vacuum
3.7 Seek and give confirmation that a task is completed	S1 Did you finish yet? S2 No, not yet. Two minutes. Yes, done. " /no, almost. S1 How much did you finish? do you have left? to go? S2 1/2, 3/4, etc.	
3.8 Report time needed to finish a task.	S1 When did you start? (3:00) When did you finish? (3:15) How long did it take? (15 minutes) Report it like this--(.25)	Oral/written problems
3.9 Talk about past events		Milk & Honey, P. 105-111

More Notes: Teaching activities

- To further practice assembly directions/terminology bring in examples of things that can be taken apart and put together e.g. ball point pens, flashlight

FUNCTION (The student can)	Structure and Vocabulary	Materials and Notes
Basic Skills		
*identify lines/points	parallel, perpendicular, point, diagonal, horizontal, vertical, curved, straight	Nucleus Unit 1 pages 1 - 2
*identify parts/whole	----consists of----	letters of the alphabet
*identify common figures	square, rectangle, triangle, circle, semi-circle, angle	The letter A consists of 2 diagonal lines and a horizontal line.
		A square consists of----
4.1 Follow instructions for using a tool or instrument.	S1 We're going to do some measurements. Lay the _____scale flat against the line. Be sure that / Make sure that (using the right side.)	6" scale
4.2 Measure length, width, height, diameter.	S1 Measure the length etc. How long is the long/length? wide/width etc.?	10 objects to be measured
4.3 spot check work	S1 Check your neighbors work. Just check the first one, the last one and one in the middle. Then be sure to initial the ones you checked.	
4.4 report finished work	S2 Did you finish yet? Are you finished? Are you done?	Appoint a student to go around and check if others finished.
4.5 follow instructions for constructing lines and shapes of a specific size.	S1 Draw 3 lines. Make the first one 2" long and vertical. etc.	

FUNCTION (the student can)	Structure and Vocabulary	Materials and Note
4.6 Compare lengths, widths, diameters, gauge	longer, shorter, wider, narrower trace a line around a circle.	various lengths string, size pipe or tubes, guage wire
4.7 estimate the length/size of a line	S1 How long do you think this book is? S2 About _____.	
4.8 round off the size of something.	S1 Measure these lines. Tell me if they're precisely, exactly/ nearly, roughly the size stated.	worksheet. _____(1")
4.9 measure a space or a gap	S1 Measure the gap between these two lines.	_____ _____ gap
SOCIAL LANGUAGE 4.10 Describes a past event at ELDEC	S2 Did you hear about_____? S1 No what happened? S2 She found out she was allergic to flux. S1 What? What do you mean? How did she find out? S2 She notices her skin was always red. So she went to the doctor. He told her to rub some of the things she was uses at work on a band-aid, one by one. Then to put the band-aid on her arm, and to pay attention to the reaction. S1 And? S2 She tried a few things. Flux turned her skin red. S1 So what's she going to do? S2 She told her lead and supervisor. They just assigned her other jobs. S1 That's nice.	Ask comprehension questions. Try to get students to talk about past experiences that happened to them.

FUNCTION (The student can)	Structure and Vocabulary	Materials and Note.
Basic Skills		
*identify objects	ball shaped, star shaped, wedge shaped	Nucleus
Work Langage		
5.1 follow directions to assemble something	**Key Terms** insert press hard Hold the rattle firmly. Slip a dics over. Let it rotate freely. Test it by sliding the discs back and forth and by spinning them.	Tinker toys Have one student leave the room. Make a rattle. Let the classmates think of directions. When directions are complete invite the student back. Let the class direct her. She should clarify/confirm instructions and make the rattle
5.2 follow assembly directions	**Key terms** Rock it gently.	Tinker toy balance bird.
5.3 describe an assembled object.	It has consists of ___	balance and rattle
5.4 describe common classroom objects in terms of physical appearance.		
5.5 Take apart assembled objects.		
5.6 Build something with common shapes.		Wood blocks, place two students back to back. Let them practice clarifying, confirming info.
5.7 Identify differences	I put_____ She put_____ This should_____	Students describe differences in structures. Look for reversed, not centered, wrong size.
5.8 Report finished work	S2 Have you finished yet? S1 Yes, I have. No, I haven't. S2 How far have you gotten? S1 Half done. Two-thirds done.	Contrast: Did you? Have you?

UNIT -

FUNCTION (The student can)	Structure and Vocabulary	Materials and Notes
Social Language		
5.9 Discuss life in	S1 How long have you lived in Seattle? Did you live in another part of the states before? Where do you live now? How long have you lived there?	
	S1 Have you ever seen _____? eaten at _____? gone to _____? tried _____?	
	S1 Yes, I have once twice a few times.	
	Have you? No, I haven't. What is it?	

Further Notes and Teaching Activities:

* To further practice social language and reading bring in example announcements. From cafeteria notice board e.g. (garage sale, Kingdome nite etc.).

FUNCTI((The student can)	Structure an ocabulary	Materials and M.
Basic Skills		
* recognize sequences and pattern	every other one alternating every third one fourth etc	Letter sequences aB cD a b c D etc
Work Language		
6.1 Identify differences	S1 They're the same/different There's a line missing. an extra line. The line isn't routed the same. The line doesn't connect the same points.	Prince/Gage Worksheets Students compare model to samples describe the difference
6.2 Direct someone to -- Correct something	**Key terms** Remove Replace Connect Add Reroute	
6.3 Make modifications in something.	S2 Write the alphabet using capital and small print. Make every other letter capital. S1 ..... S2 Hold it. Change that. Make it all capital.	Discuss revisions, changes, modifications.
6.4 Measure lines (revised exercise)	S2 Draw a 3" line. Use this ruler Pay attention to the ruler. It is a space. Line up the ruler from this point on. S2 Draw a 6" line now. Hold it. Change that to 4 1/2".	plastic rulers Ask class what revision has been made in this exercise. Ask what revision has been made Practice directing, interruptin revising. We extend, shorten-lengthen.

UNIT 6

FUNCTION (The student can)	Structure and Vocabulary	Materials and Notes
6.5 Discuss factors in terms of enough/too much	enough/too much sufficient, insufficient excessive	Nucleus, p. 60-64
Social Language		
6.6 Comment on an important personal occasion	Formula for congratulating or condoning Cue: Mary's child is sick. S1 Is that so? I'm sorry to hear that. Cue: Sue's getting married. Is that right? Congratulations on the wedding! Will she have an engagement party?	Cue's for birth, death, illness, retirement, layoff, graduation, accident.
6.7 Comment on objects	S1 Is that a new_____?	picutres, cars, hairdos, clothes

Further Notes, Activities

To extend 6.6, 6.7 bring in potpourri readings from Echo. Role play comments.

FUNCTION The student can)	Structure and cabulary	Materials and Hot
Basic Sk..l		
Work Language		
7.1 Ask for help explain how to operate, use a piece of equipment	a. S1 Can you show how to use this? S2 Sure. First, _____.	wire stripper wire check to see if student uses, Insert, check to be sure, release, etc.
	b. -plug in recorder -push the eject button to open the recorder. -insert a casette and close the cover. -push/depress fast forward to advance the tape. -push the rewind button to rewind -push the play button to listen to the tape -push the play and record buttons together/simultaneously to record. -push the stop/eject button to eject or release the tape.	Casette player
7.2 explain why something was done	S1 Why did you_____? S2 In order to _____to _____. So that_____.	Refer to 7.1

MORE NOTES AND ACTIVITIES:

* Try to write up the last dialogue as a small group story.

  Read it. Ask Questions.

  Develop it into a strip story.

FUNCTION (The student can)	Structure and Vocabulary	Materials and Notes
7.3 call attention to a malfunction/problem	S1 Can you help me? take a look at this. come here. S2 What's the matter? problem? S1 I think there's something wrong with this lighter. It must be broken. S2 How do you know? What's it doing? S1 The flame is too high. S2 I see. Have you adjusted the set screw? S1 Oh! No. I haven't. Maybe that's it. How do you do that? S2 Let me show you. Just turn this until the flame goes down. S1 I see thanks. (revise for no flame/add fluid, too low adjust).	Zippo lighter Demonstrate the lighter. Tell the class you're going to read a conversation about it. Ask questions. Then let students practice.
	b. S1 This scale must be broken. S2 Why? S1 I should be 138 lbs. This says 145 lbs. S2 I see. Have you looked at the zero set. S1 No I haven't. S2 Get off. Let me see. It's 7 lbs. off. Turn it back.	scale

UNIT 7

FUNCTION (...e student can)	Structure and Vo...bulary	Materials and Notes
Social Language		
7.4 Greet another worker: Comment on appearance	S1 You look tired. S2 I am. My child was sick all night. I came to work an hour later than usual. S1 Go to sleep early tonight. Get some rest. Two days later..... S1 You still look beat. S2 Every other day something else happens. My kid was sick again. I'm beat! S1 Lucky thing we've got flex time.	Read and ask questions. Then act out.
7.5 Comment on important personal occasion	Formula for congratulating or condoning Cue: Sue's child is sick. S: Is that so? I'm sorry to hear that. Is it serious? Cue: Joan's getting married. S: Is that right? Congratulations on the wedding. When's the engagement?	Cue for birth, deaths, illness, birthday, retirement, layoffs, graduation
7.6 Comment on objects	S1 Is that a new_____? S2 Yes. It is. No. I've worn it before. had it a while. S1 Is that right/so? It's nice. I like it. It looks new.	pictures of cars, hairdos, clothes, etc.

More ideas: Teaching Activities

- Potpourri stories in Echo are a resource for reading and gathering role play reactions.
- The Birthday
  Strip-o-grams, balloon-o-grams and other services are more and more common in-company for birthday parties. Ads from The Weekly and stories in there might be appropriate/funny stories for reading/discussion.

- Alarm clock
  A story about a worker who forgot to adjust/set her clock for daylight savings, or standard time is another reading topic. This could then be converted to a dialogue/role play.

FUNCTION (The student can:___)	Structu . and Vocabulary	Materials and Notes
WORK LANGUAGE		
8.1 Understand conditional statements	S1 Verify the count on these. If its short indicate. So is the 3rd box. If its over, mark the 2nd box. If its ok, check the 1st box.	clips, envelopes
8.2 Explain to someone how to operate a machine with many variables. (a car)		Prince/Gage Consumer material--a car (role play)
8.3 Explain bureaucratic procedure/police	S1 What do you have to do to get a driver's license? S2 You have to fill out an application. " " take an eye test. " " pay an application fee. " " show proof of age. " " take a written test. " " take a driving test.	Milk & Honey get a car loan open a savings account
8.4 make a suggestion		Milk & Honey, p. 180

FUNCTION (The student can:___)	Structure & Vocabulary	Materials/Notes
9.1 Make Suggestions		Values clarifications
9.2 Prioritize, rank items		Values clarifications
9.2 measure his/her own values and compare to American values, and his/hers cultures values.		Cultural awareness resource guide
9.3 Describe review policy		

Notes & Teaching Activities

- Read a blank performance review form. Let students self-evaluate. Let students consider form in light of American values.
- Read Echo on Safety (Feb. '83) Develop an activity for giving suggestions.

TOOLS

Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 1 - Tools

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Barnett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 1 , pages 1 - 32

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1) Identify the basic hand tools and differentiate between their various uses 2) Select the proper tool for the job 3) Name the portable and stationary power tools and list their uses 4) Recite and apply the safety rules given for each tool	see Glossary	see Glossary	1. A strong emphasis on safety cannot be over emphasized. All safety tests should be done in writing so that there is evidence that each student knows how to be safe. 2. Each tool should be available for the student to see and use. 3. Being sure that each student can pronunciate and spell the name of each tool now will save time later. 4. A field trip to a tool store to see tools that are not available at the school site and other more specialized tools, along with their prices.

Length of Lesson	Evaluation	Materials and Notes
2 weeks	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

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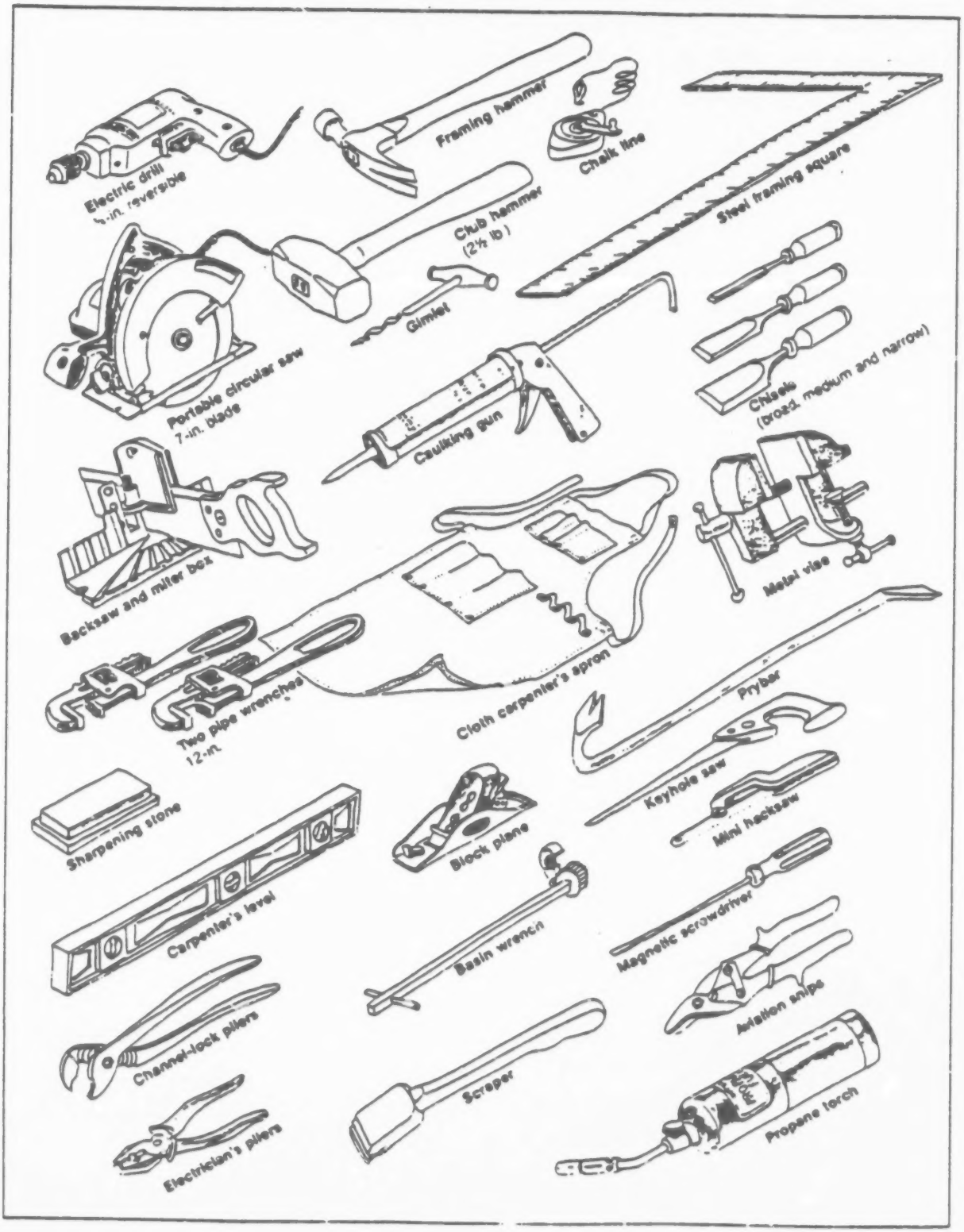
TEACHING MATERIALS

Intermediate Tool Set

These tools are the ones we consider the most useful additions to your primary tool set. Here are tools for somewhat more elaborate electrical, plumbing, and carpentry repairs. With these you can even make some modifications or additions to your house and its most vital systems.

Since these tools are not all needed for repair of emergency problems, and some of them are fairly expensive, we don't recommend you buy them all at once. You may just want to pick up the appropriate ones when you are about to embark on a project or when you see them at a good price.

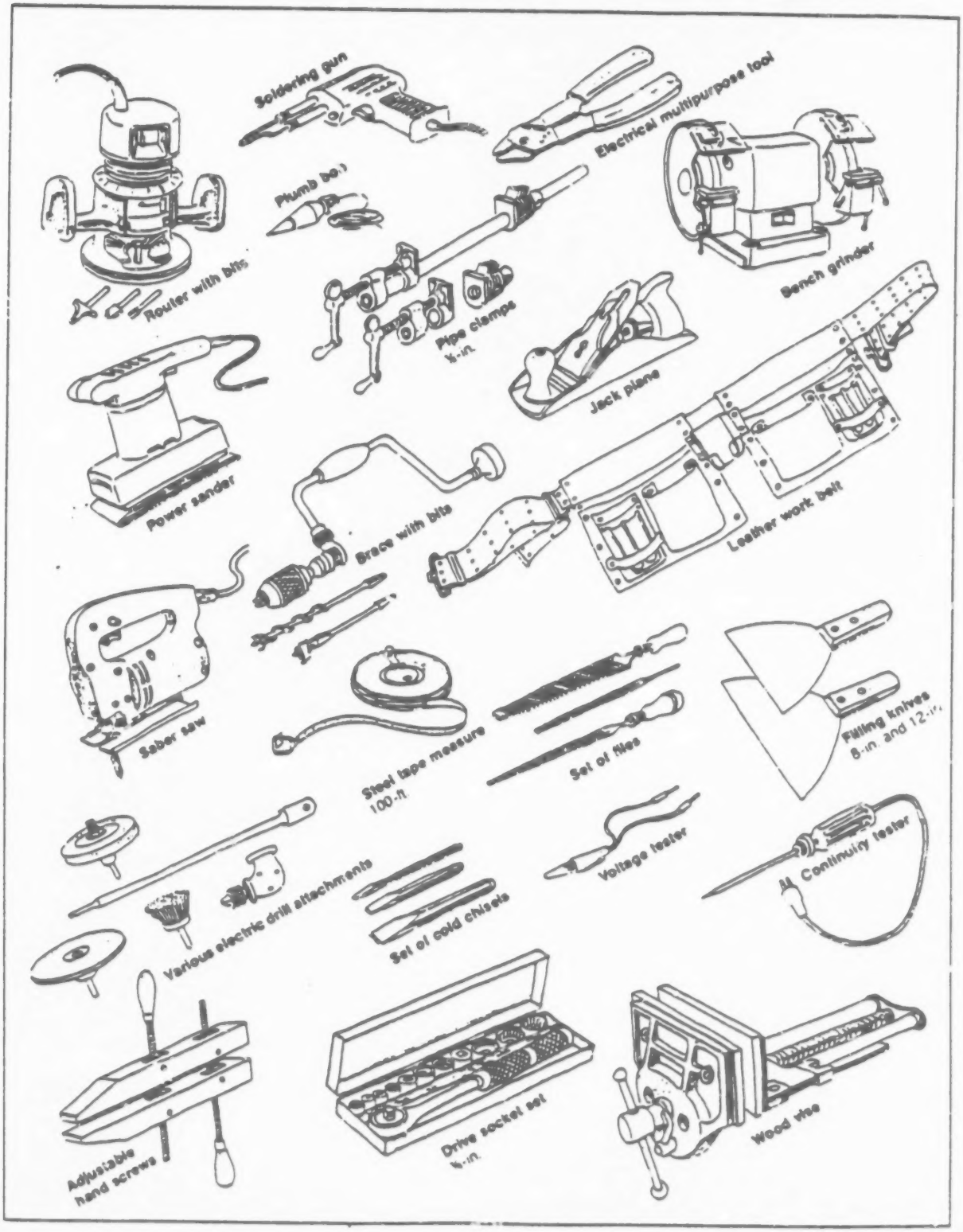
At this intermediate stage, you may also want to expand the range of your screwdrivers, hand saws and other basic hand tools to make every little job easier.



Advanced Tool Set

As your budget permits, your confidence increases, and your projects become more complicated, you will want additional tools that make the big jobs easier and give a professional looking finish. The ones shown below are some suggestions gleaned from the multitude of power tools and specialized tools on the market. Power tools, for instance, usually come in several different horsepowers and with optional blades, bits and attachments. And almost all tools come in grades of quality from supreme (usually expensive) to practically useless (usually cheaper).

Before you decide to buy a particular tool, shop around a little and satisfy yourself that it's exactly what you need for the jobs you want it to do, both now and in the future.



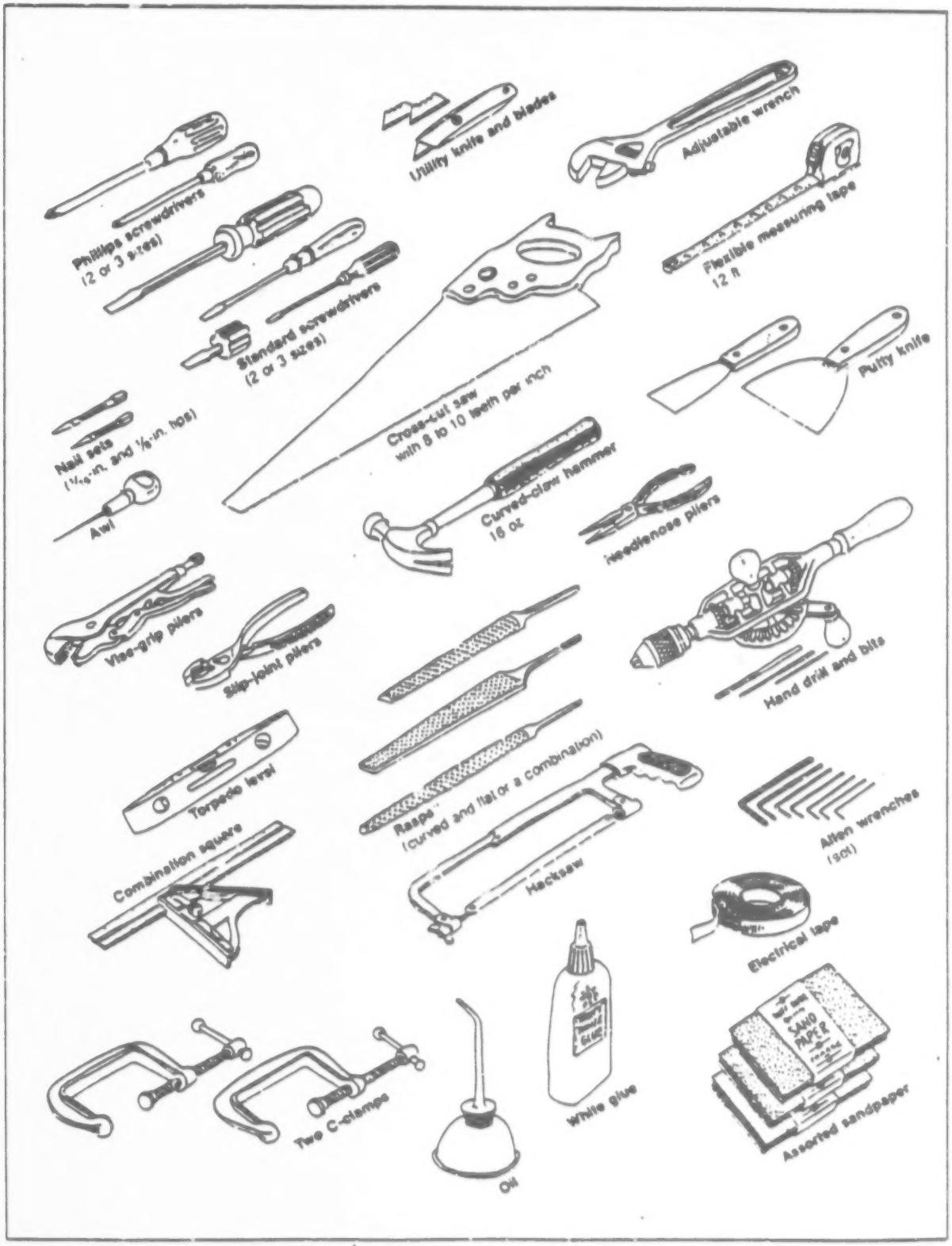
Tronic A. Hardware 1983

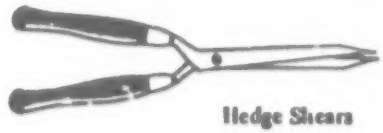
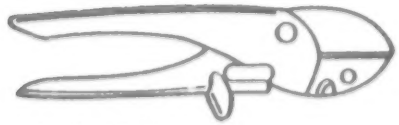
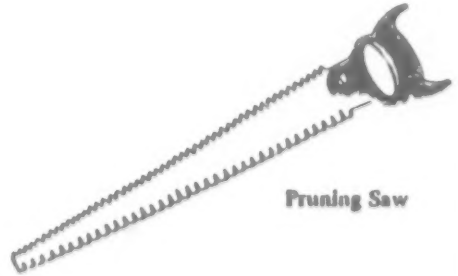
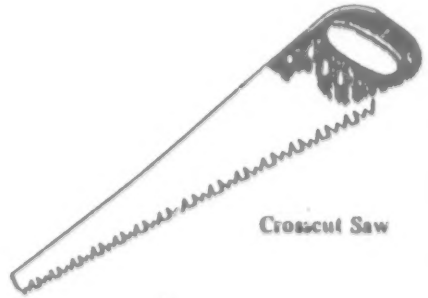
Primary Tool Set

This array of tools may seem large for a starting set. And it is for someone who plans to do only a few very minor household repairs. However, this list is designed to cover all the most basic needs, and includes tools for the most minor plumbing and electrical repairs as well as general repairs and basic carpentry.

Of course, you do not have to buy all of these tools in one bunch, but if you do, the money will be well spent. Having the right tool for the job when it needs doing may make it a pleasant task instead of frustrating drudgery.

You may also want to get a small tackle box or tool holder to keep your small tools organized and handy.



Tool and Name	Function	Tool and Name	Function
Grass Shears	Used to trim grass along walks, roadways, the edge of planting beds, and around trees, posts, etc.	 Hedge Shears	Prunes shrubs grown closely spaced as hedges. These shears are only used on young, tender new growth.
 Pruning Shears	Used to trim tree and shrub twigs up to 1/2" diameters.	 Pruning Saw	Removes any tree or shrub part which cannot be easily cut with the lopping shears. Usually parts are an inch or more in diameter.
Lopping Shears	Used to trim tree and shrub twigs up to 1 - 1-1/2" diameters.	 Crosscut Saw	Removes large limbs and small trees. The saw has additional general uses.

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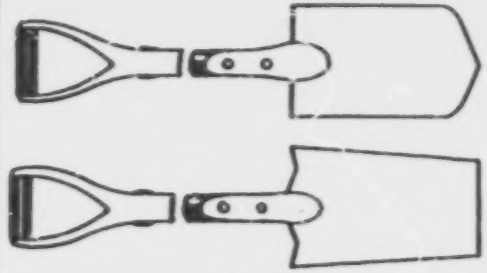
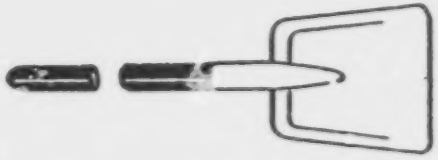
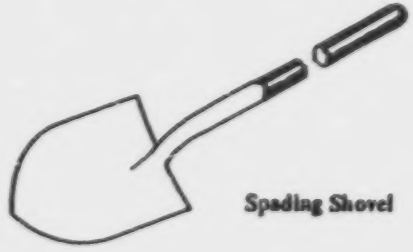
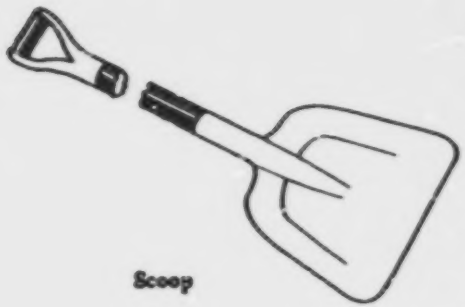
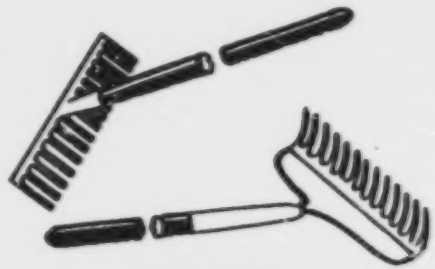
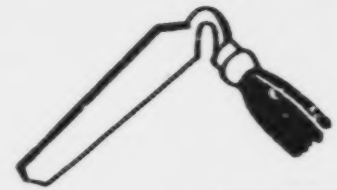
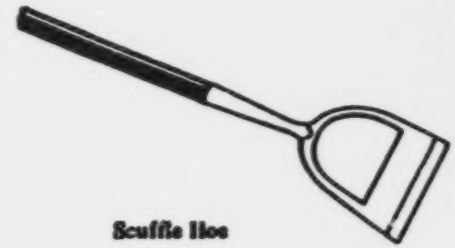
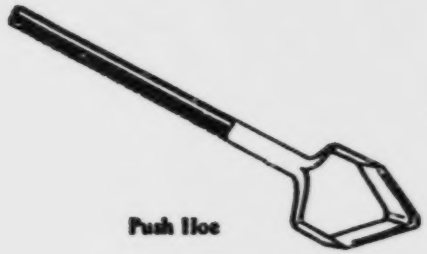
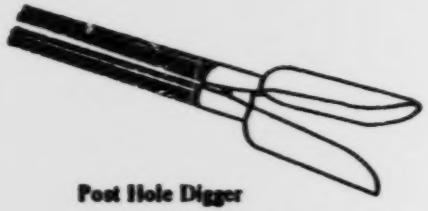
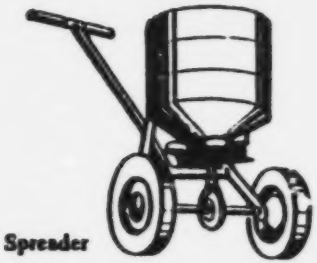
Tool and Name	Function	Tool and Name	Function
Grass Hook	For reducing the height of overgrown grass areas. It requires the user to bend over.	 Spades	Obvious general uses in digging. Spades have flatter shapes than shovels. They penetrate the soil more easily but have less scooping capability.
Grass Whip	For reducing grass height without bending over. (Once reduced in height, a lawnmower can be used on the grass.)	 Shovel	Used for cleaning loose soil from planting holes and other scooping uses. A shovel has sides that a spade does not have.
Spading Fork	Used for turning over the soil when it is not too hard or compacted. Also used for lifting bulbs in the fall.	 Spading Shovel	A combination tool having uses similar to both spades and shovel. It can be used for digging as well as scooping.

Tool and Name	Function	Tool and Name	Function
 Scoop	Good for moving loose materials such as crushed stone, peat moss, soil, etc. Scoops have high sides. They are not used for digging.	Weed Cutter	Removes annual weeds by cutting them off at ground level. Not very effective against biennial and perennial weeds.
Manure Fork	The best tool for moving coarse, lightweight materials such as straw, wood chips, etc.	 Toothed Rakes	Used for heavy duty raking which requires a strong tool. Commonly used in preparation of lawn seed beds and cultivation of planted beds.
Single-Bit and Double-Bit Axes	Obvious chopping uses. Especially useful in tree removal and for cutting up fallen timber.	Brume Rake	Very useful in places where a lightweight springy rake is needed. Very good for collecting debris and clippings from lawn surface.

Tool and Name	Function	Tool and Name	Function
Lawn Comb	An excellent rake for collection of leaves and coarse debris from lawn surface.	Hand Trowel	Used for transplanting bedding plants into flower beds, borders, and boxes.
Shrub Comb	Used for raking debris from small areas between shrubs.	 Transplanting Hoe	Uses are similar to those of a hand trowel. It has less adaptability for other types of digging.
Bulb Planter	Used to install flowering bulbs.	 Scuffle Hoe	Useful in weeding and cultivating in planted beds. It cuts off weeds and loosens surface soil.

Tool and Name	Function	Tool and Name	Function
 Push Hoe	Similar to a scuffle hoe. It is good for rooting out weeds.	 Post Hole Digger	Prepares holes for the support posts of fences.
Garden Hoe	Widely used for breaking up the soil prior to planting. It is also good for cultivating planted beds and for weed removal.	Grading Hoe	Loosens hard or compacted soil during preparation for planting. Has a sharpened flat end.
Hand Cultivator	Loosens the surface soil in flower beds and around shrubs.	Cutter Mattock	Stronger than a grade hoe. Its uses are similar. It has two flat ends.

Tool and Name	Function
Pick	Used for breaking up hard rocky soil. It has two pointed ends for gouging into the soil.
 Spreader	Used for the application of fertilizer, seed, and other dry turf products.
Sprayer	Needed to apply pesticides, antitranspirants, and other chemicals in liquid form. Sprayers are available in a wide range of sizes.

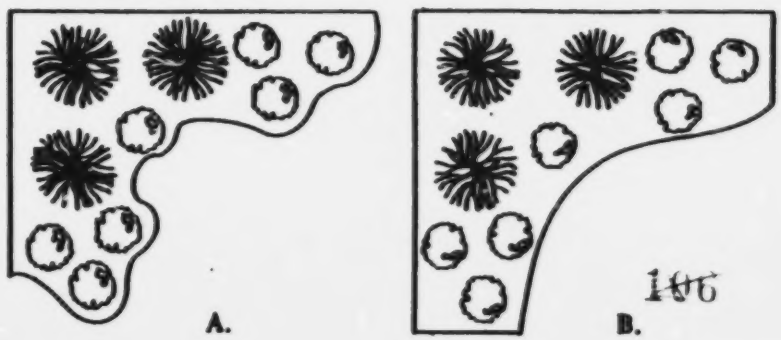
THE RELATIONSHIP BETWEEN LANDSCAPE DESIGN AND LANDSCAPE MAINTENANCE

It is important that the landscape designer be concerned with the amount of care necessary to keep the landscape attractive. If designers are thoughtless in their planning, the grounds keeper may be faced with many problems. For example, some plants are known to be especially apt to attract insects and disease, requiring a great deal of costly spraying to keep them healthy looking. Other plants which are less susceptible can be used to fill the same role, thereby reducing maintenance. Certain plants have demanding soil requirements. The use of these plants can also cause extra work for the grounds keeper. The designer might specify other plants which require less attention.

Other design specifications can act to lighten or burden the job of the landscape grounds keeper. A smooth-edged, flowing bedline is easier to mow along than a fussy complex bedline, figure 3-1. Where walks intersect at 90-degree angles, a specific design can minimize wear on the lawn; this in turn requires less maintenance time, figure 3-2.

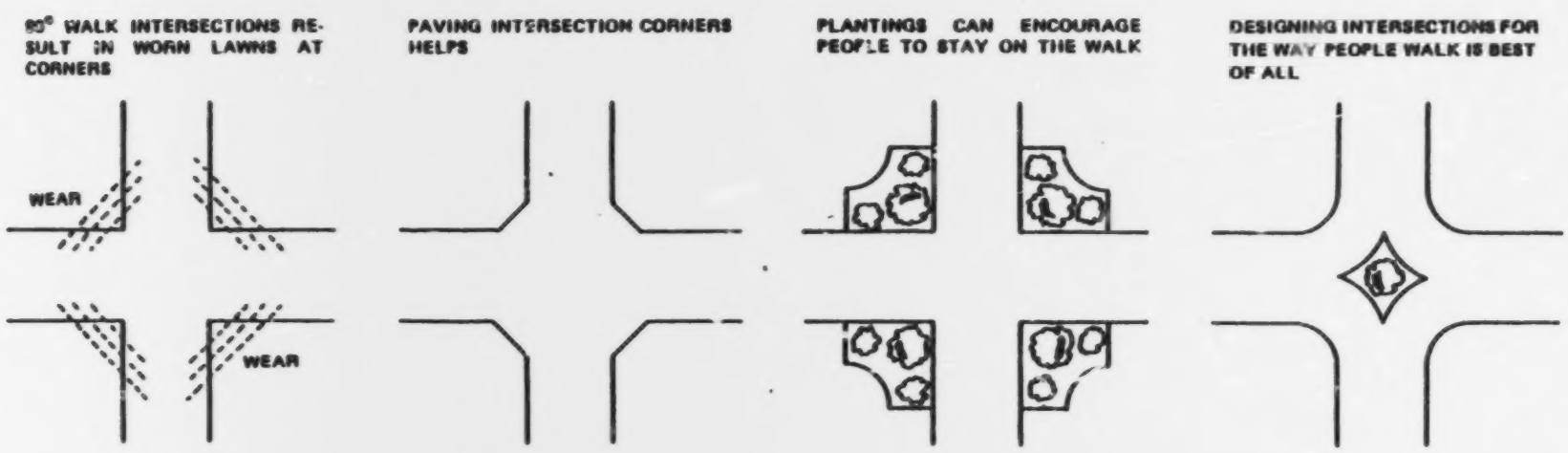
In brief, the amount of care required by a landscape can be controlled to some extent by the designer. It is the responsibility

Fig. 3-1 Landscape maintenance can be made easier by a thoughtful designer. Bedline A is fussy and complex. Mowing along this bedline would be a time-consuming process. Bedline B, more thoughtfully designed, would be easier to maintain.



of the designer to know the requirements of landscape maintenance so that maintenance time can be kept to a minimum. If possible, grounds keepers responsible for maintenance should be given the opportunity to review landscape plans early in their development so that their suggestions for easier maintenance can be taken into consideration.

Fig. 3-2 Various design techniques used to reduce wear on lawns.

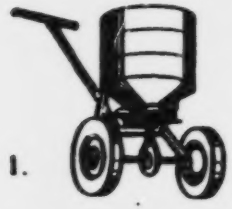

90° WALK INTERSECTIONS RESULT IN WORN LAWNS AT CORNERS
WEAR
WEAR
PAVING INTERSECTION CORNERS HELPS
PLANTINGS CAN ENCOURAGE PEOPLE TO STAY ON THE WALK
DESIGNING INTERSECTIONS FOR THE WAY PEOPLE WALK IS BEST OF ALL

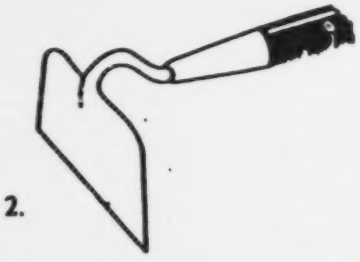
ACHIEVEMENT REVIEW

A. Select from the list below those jobs which are done as a part of landscape maintenance.

1. constructing patios
2. mowing lawns
3. pruning dead tree limbs
4. designing landscape plans
5. fertilizing lawns
6. raking leaves
7. preparing new planting beds
8. adding fresh mulch to plantings
9. installing swimming pools
10. building fences

B. Identify and spell correctly the following tools.

1. 

2. 

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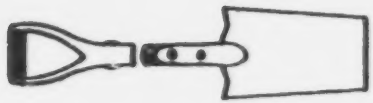
4. 

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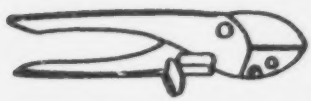
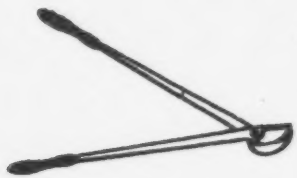
8. 

9. 

10.

SUGGESTED ACTIVITIES

1. Do a study of maintenance requirements of your school's landscape. Select ten different features (such as shrub beds, trees, parking lots, and entrances) and rank them in order of ease or difficulty of maintenance.
2. Itemize all of the maintenance requirements necessary for the proper upkeep of each feature given in your answer to question 1.
3. Match the maintenance requirements listed in question 2 with the proper tools needed to accomplish the job.

TESTS

POWER MECHANICS SAFETY TEST

Directions: Answer the following statements true or false on a separate sheet of paper.

T F 1. You should ask your teacher to approve all work that you do.

T F 2. You should report all injuries, even if they are minor, to your teacher immediately.

T F 3. You must wear safety goggles or a face shield when engaged in any activities where eye hazards are present.

T F 4. It is best to fasten or remove loose clothing and roll loose sleeves above the elbows after operating any machine.

T F 5. You should keep long hair away from rotating equipment.

T F 6. The designated area or operation zone around a machine is designed to protect the student operating the machine.

T F 7. Cooperation with your classmates is a must for the operation of a good safety program in the shop.

T F 8. It is not your responsibility to caution other students you see violating a safety rule.

T F 9. If you notice any breakage or damage to a tool, you should say nothing because you might be blamed.

T F 10. Rags containing oil or gasoline should be kept in a covered metal container.

T F 11. It is best that any liquid or oil spilled on the floor be wiped up immediately.

T F 12. You should use gasoline for cleaning oily or greasy engines.

T F 13. Gasoline and other combustible liquids may be stored in open containers.

T F 14. It is best to keep tools and materials from projecting over the edge of benches.

T F 15. You should exercise care in handling and lifting large, heavy objects because serious strains may be the result.

T F 16. Your hands should be dirty, greasy, and oily as possible when using tools.

T F 17. An open end or adjustable wrench may be used in place of a hammer.

T F 18. You should report all broken or damaged tools to your teacher.

T F 19. Pointed tools should be carried with their points up.

T F 20. Tools should be passed to your classmates with the working end first.

T F 21. Be sure to place your other hand ahead of the screwdriver when tightening a screw.

T F 22. When using an open end wrench, you should exert a pulling force on the handle.

T F 23. It is alright to hammer on a wrench to break loose a tight or rusty nut.

T F 24. If a nut or bolt cannot be turned, you should add an extension, such as a piece of pipe, on the end of the wrench.

T F 25. When using an adjustable wrench, be sure to exert the force on the stationary jaw.

T F 26. You may use pliers to turn a nut or bolt if you do not have the exact size wrench.

T F 27. Never hammer on any screwdriver.

T F 28. You need not be careful of pinching your fingers when using pliers.

T F 29. Before using any power equipment you should obtain permission from your teacher.

T F 30. Use the top side of a wire wheel.

T F 31. Never wire brush any object with wires, chains, or cords attached.

T F 32. You should keep your fingers and hands away from the revolving wire wheel brush.

T F 33. It is not necessary to wear a face shield or safety goggles when using the wire wheel brush.

T F 34. Obtain permission from your teacher before starting an engine.

T F 35. You may remove the governor control if the engine runs too slow.

T F 36. It is best to remove the spark plug before working on an engine or equipment driven by the engine.

T F 37. You should provide proper ventilation when running an engine in the shop.

T F 38. The gasoline tank may be filled while the engine is running.

T F 39. Serious burns may result if you come in contact with the muffler of a hot engine.

T F 40. Extreme caution should be exercised when working and adjusting a running engine.

T F 41. It is possible to receive an electrical shock if you come in contact with the spark plug or wire of a running engine.

T F 42. You should be sure that people stand aside when starting an engine.

T F 43. You may start or run an engine with a leaking fuel line or carburetor.

T F 44. You should vent exhaust to the outside of the shop because it will prevent the release of carbon monoxide exhaust gases into the room.

T F 45. A carbon dioxide (CO^2) fire extinguisher should be used to extinguish flammable liquid fires.

SAFETY PLEDGE

THIS IS TO CERTIFY that I have received safety instruction in the above areas. I promise to observe all safety precautions and if ever in doubt regarding any operation, I will get the necessary information from my teacher.

Date_____ 19 ___ Signed _____

PLEDGE TO BE INCLUDED ON EACH SAFETY TEST ANSWER SHEET AND TO BE DATED AND SIGNED BY EACH STUDENT WHEN TEST IS COMPLETED.

Property Management and Maintenance

TOOL QUIZ

1. Name and spell correctly 20 of the hand tools in chapter 1

2. Name four portable power tools

3. Name two stationary power tools

4. What is a carbide-tipped blade? Why is it used?

5. What is the difference between an orbital and a vibrator sander?

6. On what type of job would you need a coping saw?

7. When do you use a rip saw? A cross-cut saw?

8. Which tool is used to place a nail <u>below</u> the surface of the wood?

TECHNICAL GLOSSARY

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

CHAPTER I

maintenance	bảo dưỡng	保養
claw hammer	búa đinh	釘錘
screwdriver	đồ vặn đinh ốc	螺絲起子
regular blade	lưỡi thường(vít, dao)	普通螺絲起子头
phillips-head screwdrive	đồ vặn đinh ốc bốn cạnh	四角螺絲起子
smooth plane	cái bào	鉋
chisel	cái đục	凿
" (inch)	ký hiệu phân Anh	英寸的符号
utility knife	dao bấm	伸缩刀
combination square	thước vuông hỗn hợp	混合平方尺
ruler	thước kẻ	尺
metric	hệ thước tây	公尺的
handsaw	cưa tay	手鋸
crosscut	cắt ngang	横鋸的
point	tương đương 1/72 phân Anh	约六分之一时
nail set	dùi để đóng đinh	壓釘樣
hacksaw	cưa sắt	鋼鋸
countersink	đục nõm	凹錐(凹錐)
hand drill	khoan tay	手鑽
set of twist drills	một bộ mũi khoan	一套鑽頭
bit brace	khoan tay trục chữ U	曲柄鑽孔器
ratchet	bánh xe răng cưa	制輪
auger bit	mũi khoan	鑽頭
long-nose pliers	kìm dài đầu	长頭鉗

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

cutter	đồ cắt	截断器
wrench	mỏ lết	板钳
stepladder	thang bốn chân	四脚梯
electric drill	khoan điện	电鑽
chuck	ngàm (giữ mũi khoan)	鑽軋頭
spade-type	hình cái mai (thuổng)	鏡型
bit	mũi khoan	鑽頭
center punch	cái bon-tu, dùi	打孔器
oilstone	đá mài	油磨刀石
vise	kìm vặn	虎頭鉗
cord	dây điện	电線
backsaw	cưa ngắn	短鋸
teeth per inch	số răng cưa trong 1 phan	一寸内之鋸齒
miter box	hộp đựng đồ (thợ mộc)	斜接箱
coping saw	cưa nhỏ hình chữ U	U字形小鋸子
blade	lưỡi cưa	刃
rip	cưa dọc	縱向鋸
propane	chất pơ-rô-pan	丙烷
torch	ống hàn	焊接燈
spark lighter	vật đánh lửa	打火器
putty knife	dao mát-tíc	油灰刀
# (number)	ký hiệu số	號碼之記號
level	ống thăng bằng	水平儀
C- clamp	bàn kẹp hình C	C型夾鉗
hardware	đồ sắt	鐵器

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

driving	đóng, đẩy	推進
brad	đinh không đầu	曲頭釘
metal-encased	vỏ sắt	鉄鞘
three-wire	3 giây	三線
three-pronged plug	nút cắm 3 chạc	三叉插頭
safety-guard	hệ thống an toàn	安全裝置
blade	vật mỏng phẳng	平面物
snap back	tự về vị trí cũ	自动回復
chute	máng	旋槽
three-speed	3 vận tốc	三速
variable speed control	không chế bất đồng vận tốc	不同速度控制
motor	động cơ	發動機
power	sức mạnh	動力
stalling	làm ngưng lại	使停止
board	tấm ván	板
portable	có thể mang đi được	可攜帶的
trigger	cò bấm	掣柄
shank	thân, chuôi	柄
twist drill bit	mũi khoan	鑽錐
masonry	kiến trúc gạch đá	泥水工程
carbon steel	thép đen	碳鋼
high-speed steel	thép cao tốc	高速鋼
fractional size	cỡ nhỏ	微少的尺寸
paint mixer	máy trộn sơn	油漆攪拌器
disk sander	máy đánh bóng hình tròn	平圓打滑机

PROPERTY MANAGEMENT AND MAINTENANCE TECHNICAL VOCABULARY

wire brush	bàn chải dây thép	鋼絲刷子
grinding wheel	đá mài	磨輪
polishing wheel	đồ đánh bóng	擦亮輪
slow-down attachment	phụ tùng với vận tốc thấp	低速附加物
hole saw	cưa khoét lỗ	掘坑鋸
clamp	kẹt lại	夾住
goggle	kính lồi (che mắt)	護目鏡
safety glass	kính an toàn	安全鏡
belt sander	máy nhám	沙擦机
fine grit	cát mịn	微砂
finish work	việc làm cuối	最后工作
abrasive	chất dùng công việc để mài	研磨料
emery	sa-thạch	金剛砂
garnet	ngọc thạch-lựu	石榴石
aluminum oxide	chất a-lu-min	礬土
replacing	thay đổi	替換
adjusting	điều chỉnh	調整
lubricating	dầu mỡ cho trơn	使潤滑
bear down	ấn xuống	壓下
coarse	cát thô	粗砂
marring	làm hỏng	弄坏
orbital	chạy vòng tròn	迴轉的
vibrator sander	máy nhám kiểu rung động	振動的擦机
abrasive paper	giấy nhám	砂纸
grain	thớ gỗ	木紋
saber saw	cưa dùng cho đường cong	曲線鋸

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

jigsaw	cưa hẹp bản	線花鋸
rip fence	cây dẫn	導杆
metal guide	cây dẫn bằng kim loại	金屬導桿
wallboard	gỗ dán	人造壁板
sawhorse	ngựa thợ mộc (đỡ kê cưa đĩa)	鋸木架
waste side	phần bỏ	廢邊
filing	gọt giũa	銼削
nonconductive plastic	nhựa cách điện	无傳電的塑膠
electric shock	điện giật	電擊
plugged in	cắm vào (ổ cắm)	插進
laminate	nhựa ép thành phiến	積層塑膠板
masonite	nhựa tổng hợp	纖維板
asbestos	thạch miến	石綿
gauges	lượng kế	儀錶
45-degree angle	góc 45 độ	45 度角
grounded outlet	ổ cắm ba lỗ	接地插座
kickback	giựt lại	反撲
buck	nhảy ra	跳起來
stationary	cố định	固定的
tenon	mộng	接榫
taper	hình nón	錐狀
groove	xoi rãnh	凹槽
arbor	trục	軸
hollow-ground	phía trong lõm	內凹陷
plywood blade	cưa răng nhỏ dùng để cắt gỗ dán	夾板用的鋸

PROPERTY MANAGEMENT AND MAINTENANCE TECHNICAL VOCABULARY

carbide-tipped	đầu các-bua	碳化鎢尖端
rip fence	cây kẹp điều chỉnh	調整桿
throat plate	đĩa che (chung lỗ hổng quanh lưỡi cưa)	蓋板在鋸露出外的周圍
extension wings	bản mở rộng	伸展板
radial-arm	cưa ly tâm	伸展左側鋸手
yoke	ách	繫鐵
360 degrees	360 độ	360度
arm track	phụ kiện trên ách giúp cưa di chuyển đi lại	軌道(附加在繫鐵上)
grinder	máy mài	磨机
sharpen	làm sắc	使銳利
horsepower	mã-lực	馬力
toolrest	giá đặt dụng cụ (mài)	架具架
safety shield	lá chắn an toàn	安全遮
overheating	quá nóng	太熱
hardness	độ cứng	硬度
V-belt pulley	cái rọc rách dùng dây cu-roa hình chữ V	V-帶式滑輪
RPM	vận tốc máy trong 1 phút	轉速-分鐘內之計算
dressing	mài sửa	修正
metric	hệ thước tây	公尺的
liter	lít	公升
conversion charts	bảng biến đổi	變換表

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

CHAPTER I

tools	dụng cụ	用具
repair	sửa chữa	修理
expensive	mắc, đắt	花錢的，貴的
dangerous	nguy hiểm	危險的
list	mục lục	目錄
suggest	kiến nghị	建議
basic	cơ bản	基本
collection	thu thập	收集
regularly	đều đặn	定期地
available	có thể	可能的
complete	đầy đủ	齐全
properly	thích đáng	适当
solid	vững chắc	完實的
foundation	cơ bản	基礎
combination	sự tổng hợp	配合
open-end	đầng cuối hở	末端开口的
adjustable	có thể điều chỉnh	可調整的
wooden	bằng gỗ	木制的
extend	mở rộng	擴充
capabilities	tài năng	才能
sharpening	làm cho sắc, bén	使銳利
woodworking	làm đồ mộc	木工
extension	kéo dài thêm	伸长
extra	đặc biệt	特别的

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

jaw	hàm	叉頭
alumium	nhôm	鋁
gadget	đồ phụ tùng	附屬品
factor	nguyên tố	因数
useful	hữu dụng	有益
instructor	thầy giáo	教師
incorrectly	không đúng	不适当的
local	địa phương	地方
library	thư viện	圖書館
select	lựa chọn	揀選
specific	đặc biệt	特殊的
operating	thao tác, sử dụng	操作
proper	thích đáng	适当
expose	lộ ra	露出
deflect	làm trẹo	使歪
versatility	nhiều phương diện	能力多方面
middle	ở giữa	中间
heavy	to lớn, nặng	巨大的，重的
common	thông dụng	通常
popular	nhiều người biết tới	通俗
accessories	phụ tùng	附件
squeezing	siết chặt	緊勒
reversible	quay ngược	可反轉的
remove	lấy ra	取去
capacity	dung lượng	容量

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE

RELATED GENERAL VOCABULARY

heavy duty	trách nhiệm nặng nề	巨大的责任
industrial	thuộc về kỹ nghệ	工業的
individually	riêng biệt	個別的
attachments	đồ phụ tùng	附着物
safety rules	quy tắc an toàn	安全规则
operating	thao tác	操作
damp	ẩm ướt	潮濕
smoothing	bằng phẳng	平滑
rough	thô	粗糙的
horizontal	ngang, bằng	平坦的
vaccuum up	hút	吸取
firmly	chắc chắn	牢固
movement	chuyển động	運轉
trench	rãnh	渠
gradually	từ từ (lần lần)	逐漸地
run over	chạy qua	走過
tilt	nghiêng	傾斜
caught	giữ lại, mắc	絆住
damage	tổn hại	損害
continuos	không đứt quãng	无間断的
versatile	đa dụng	用途多的
flat	nằm ngang	平坦
scratches	những vết vạch	抓痕
curve	đường cong	彎曲
burn out	hỏng	損坏
working loose	rời ra trong khi làm việc.	工作时鬆弛

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

variety	nhiều loại	多類
correspond	tương xứng	一致
shoot	vọt ra	拋出
left-handed	dùng tay trái	使用左手
supported	vật đỡ	支持
obstructions	vật cản	妨礙物
parallel	song song	平行
scrap	mảnh vụn	碎片
auxiliary	phụ tá	補助的
sturdy	cường tráng	穩固的
elevating	điều chỉnh cao thấp	調整高低
revolving	đang quay	旋轉的
complete	hoàn toàn	完全
force	cưỡng bức	强迫
diameter	đường kính	直徑
thickness	độ dầy	厚度
fragment	mảnh vụn	碎片
spark	tia lửa	火花
water container	đồ chứa nước	水容器
crack	rạn nứt	裂縫
misshapen	biến hình, méo	畸形的
eventually	sau cùng	終於
customary measurement system	hệ đo lường Anh	英測量法

CARE OF TOOLS AND EQUIPMENT

Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 2 - Care of Tools & Equipment

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Bennett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 2 , pages 33 - 48

Lab Manual pages _____

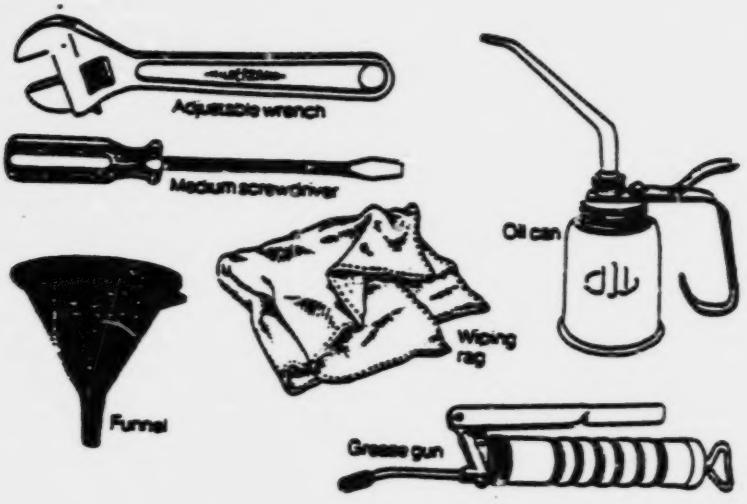
Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. Remove rust from tools by hand and with the wire wheel 2. Sharpen edged tools with an oilstone 3. Sharpen tools on the grinder 4. Properly select and use round, flat, three cornered, and square files 5. Use the grinder and freehand method to sharpen a twist drill bit 6. Properly replace a wooden hammer handle with wedges	see Glossary	see Glossary	1. Students should be encouraged to bring in used and abused tools from home to repair since the tools in class are often not in bad enough shape to learn from 2. A considerable amount of time should be reserved for sharpening twist drills as a lot of practice is needed for most to get the hang of it. A large source of old twist drills is desirable

Length of Lesson	Evaluation	Materials and Notes
2 weeks	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

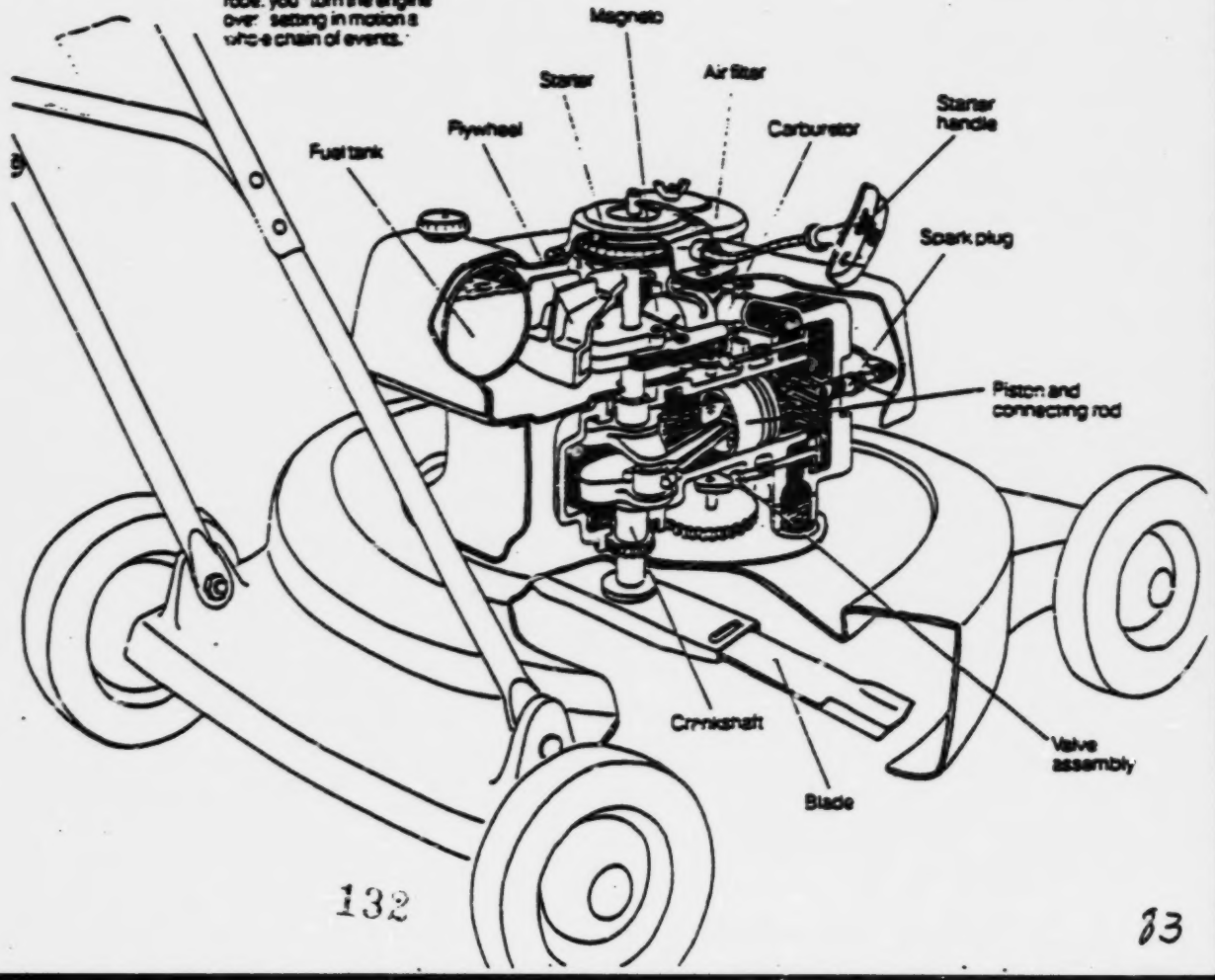
TEACHING MATERIALS

Lubricating Tools



Parts of a Small Gasoline Engine

When you pull the starter rope, you "turn the engine over" setting in motion a whole chain of events.



TESTS

PROPERTY MANAGEMENT AND MAINTENANCE

Care of Tools Quiz

1. What are three tools or materials used to remove rust?

2. What does the word "combination" mean in the term "combination oilstone"?

3. When grinding a cold chisel:

   a. What is the approximate angle of bevelled cutting edge?

   b. Is the cutting edge slightly curved or flat?

4. Name 4 different types of files and list one use of each.

	Name	Use
a.		
b.		
c.		
d.		

5. What are the two different methods that can be used to sharpen a twist drill?

TECHNICAL GLOSSARY

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

CHAPTER II

well-maintained	bảo dưỡng tốt	.適當的維修
rust	rỉ sắt	鐵銹
steel wool	thép sợi	鋼絲
turpentine	nhựa thông	松脂
benzine	an-tức-du	石油精
rag	giẻ lau	破布
bevel	tà-giác	斜角
tempter	độ cứng	硬度
nick	vết mẻ	缺口
honed	mài tay trên đá mài dầu	用磨刀石磨
keen	bén, sắc	銳利的
residue	đồ thừa, bã	殘渣
hatchet	riu	手斧
mushrcomed	hình nấm	香菇形
hammer blows	búa nện	鐵錘打擊
ground straight	mài bằng	磨平
screw slot	rãnh đầu con vít	螺絲釘孔
three-cornered file	rũa ba cạnh	三边銼刀
anger-bit file	rũa dũng cho mũi khoan	鑽銼
drill-sharpening attachment	phụ tũng mài mũi khoan	磨鑽附件
set the teeth	chỉnh răng cưa	調整鋸牙
solid or drift punch	rui	衝孔[器]
mallet	vồ đóng	木槌
wedge	cái nem	楔子

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

ball-peen	búa đầu tròn	球狀錘頭
hardwood	gỗ cứng	硬木
swell	phình lên	膨大
buff	đánh bóng	擦亮
baseplate	miếng kim loại phần dưới	底板
sealed bearing	trục (cút-si-nê) bịt kín	密封的軸承
insulation	sự làm cách điện	隔離(電)

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

CHAPTER II

care	giữ gìn, bảo dưỡng	照料
important	quan trọng	重要
successful	thành công	成功的
improvise	tuỳ tiện, không chuẩn bị trước	臨時而作
oily	dầu, nhớt	含油的
storage facility	nơi cất giữ	保管处
installing	lắp, đặt	安插
workable condition	trạng thái dùng được	可使用狀態
chemical	hóa chất	化学品
float	nổi lên	浮起
glazed	láng bóng	上釉
clogged	làm ngăn trở	障礙
back-and-forth	đi-lại	往復
figure-eight movement	di động hình số 8	移動8字形
spread out	xòe ra	伸展开出
freehand	tự động	自動力
latter	thứ sau, cuối	後者的
imaginary	tưởng tượng	想像的
clearance	khoảng trống	餘隙
specification	chỉ dẫn chi tiết	規格說明
enlarged	lớn ra	擴大
distorted	méo mó	歪曲
axis	trục	軸由
twisting	quay xoắn ốc	拧轉

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

clockwise	chiều kim đồng hồ	.右旋的
accuracy	chính xác	準确性
tedious	chán ngắt	沉悶的
periodically	định kỳ	定期的
paste	hồ	漿糊
wax	chất sáp	蠟劑

PLUMBING REPAIRS

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 3 - Plumbing Repairs

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Bennett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 3 , pages 49 - 64

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. Identify the common hand tools and differentiate between their various uses 2. Replace a washer in various types of faucets 3. Replace faucet packing and properly use a faucet reseating tool 4. Trouble-shool toilet tank problems 5. Assemble and disassemble various plumbing systems involving traps 6. Properly thaw a frozen pipe 7. Identify the parts of a toilet tank and faucet and understand each parts use	see Glossary	see Glossary	1. A supply of old sinks, faucets, toilet tanks, pipes, and traps will prove invaluable to gain experience in this section Many plumbers will gladly supply these items since they discard them, but they need advance notice to save them 2. White-out the names of the parts of the toilet in tank and faucet and have the students fill it in

Length of Lesson	Evaluation	Materials and Notes
2 weeks	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

TEACHING MATERIALS

SQUARE MEASURE
144 sq in = 1 sq ft
9 sq ft = 1 sq yd
272.25 sq ft = 1 sq rod
160 sq rods = 1 acre

VOLUME MEASURE
1728 cu in = 1 cu ft
27 cu ft = 1 cu yd

MEASURES OF CAPACITY
1 cup = 8 fl oz
2 cups = 1 pint
2 pints = 1 quart
4 quarts = 1 gallon
2 gallons = 1 peck
4 pecks = 1 bushel

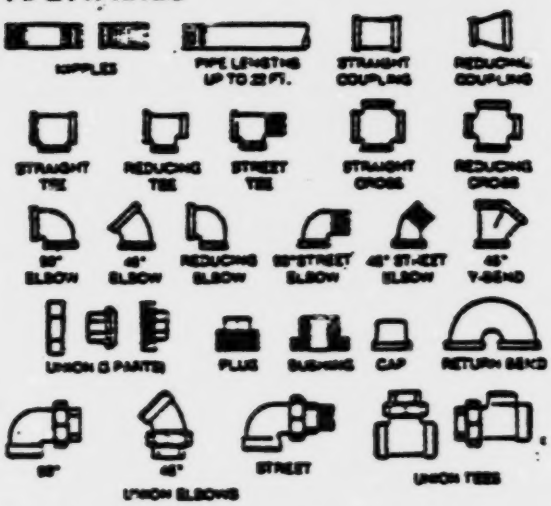
LINEAR MEASURE
16.5 ft = 1 rod
320 rods = 5280 ft = 1 mile

ABRASIVE PAPER GRADES

GRIT	EQUIV "C" SERIES	GENERAL DESCRIPTION	REMARKS
600	—	SUPER-FINE	USED FOR WET SANDING PRODUCES HIGH SATIN FINISH
500	—		
400	10C		GENERAL RANGE OF ABRASIVE PAPERS USED FOR WET SANDING LACQUER AND VARNISH TOP COATS
360	—		
320	9C		
280	8C	VERY FINE	USED FOR DRY SANDING ALL FINISHING UNDERCOATS. THESE GRADES WILL NOT SHOW SANDING MARKS
240	7C		
220	6C		
180	5C	FINE	FOR FINAL SANDING OF BARE WOOD. GOOD FOR SMOOTHING OLD PAINT
150	4C		
120	3C	MEDIUM	USE FOR GENERAL WOOD SANDING. GOOD FOR FIRST SMOOTHING OF OLD PAINT, PLASTER PATCHES
100	2C		
80	1C		
60	½	COARSE	USE No ½ FOR ROUGH-WOOD SANDING. No 1 IS COARSEST PAPER WHICH CAN BE USED TO ADVANTAGE WITH PAD SANDER
50	1		
40	1½		
36	2	VERY COARSE	ALL TOO COARSE FOR PAD SANDERS. THESE GRADES REQUIRE HEAVY MACHINES AND HIGH SPEED TO CUT WELL
30	2½		
24	3		

Grades generally supplied as Very Fine, Fine, Medium and Coarse

PIPE FITTINGS



Here are the common steel pipe fittings. Nipples are simply short lengths of pipe threaded on both ends. Reducing fittings join two different sizes of pipe.

Compression fittings of the flared-tube type are the easiest for the novice to handle when working with copper tubing.

STANDARD STEEL PIPE
(All Dimensions in Inches)

Nominal Size	Outside Diameter	Inside Diameter	Nominal Size	Outside Diameter	Inside Diameter
⅛	0.405	0.269	1	1.315	1.049
¼	0.540	0.364	1¼	1.660	1.380
⅜	0.675	0.493	1½	1.900	1.610
½	0.840	0.622	2	2.375	2.067
¾	1.050	0.824	2½	2.875	2.469

Fluid Measure

(Milliliters [ml] and cubic centimeters [cc or cu cm] are equivalent, but it is customary to use milliliters for liquids.)

1 cu in = 16.39 ml
1 fl oz = 29.6 ml
1 cup = 237 ml
1 pint = 473 ml
1 quart = 946 ml
= .946 liters
1 gallon = 3785 ml
= 3.785 liters

Formula: fluid ounces × 29.573 529 562 5* = milliliters

Linear Measure

feet	centimeters	meters
1	30.48*	.3048*
2	61	.61
3	91	.91
4	122	1.22
5	152	1.52
6	183	1.83
7	213	2.13
8	244	2.44
9	274	2.74
10	305	3.05
50	1524*	15.24*
100	3048*	30.48*

inches	centimeters
1	2.54*
2	5.1
3	7.6
4	10.2
5	12.7*
6	15.2
7	17.8
8	20.3
9	22.9
10	25.4*
11	27.9
12	30.5

inches	millimeters
1/16	1.5875*
⅛	3.2
3/16	4.8
¼	6.35*
5/16	7.9
⅜	9.5
7/16	11.1
½	12.7*
9/16	14.3
⅝	15.9
11/16	17.5
¾	19.05*
13/16	20.6
⅞	22.2
15/16	23.8
1	25.4*

Formula: meters × 3.2808 = feet
1 kilometer = 3280.839 8 feet
= .621 371 miles

The Hearst Corporation

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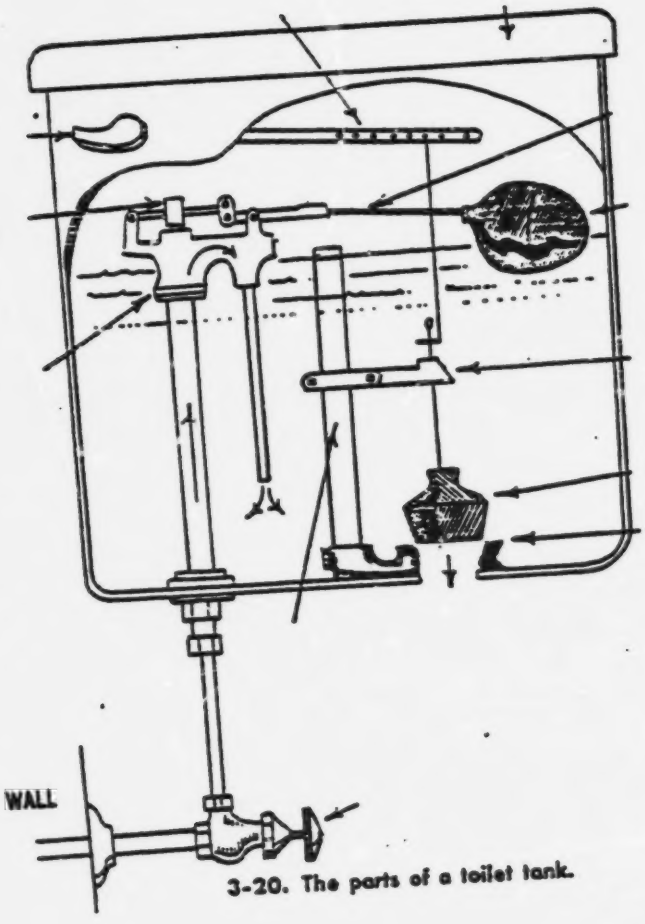
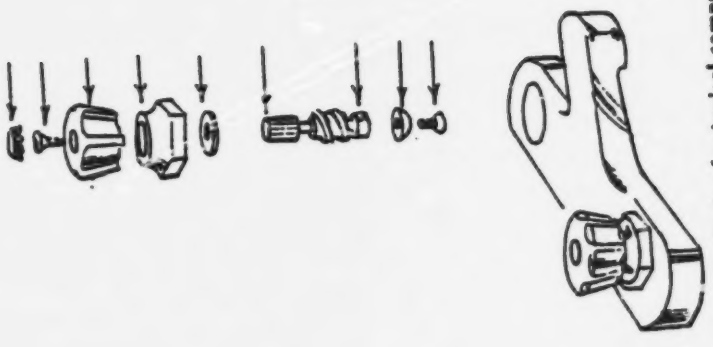
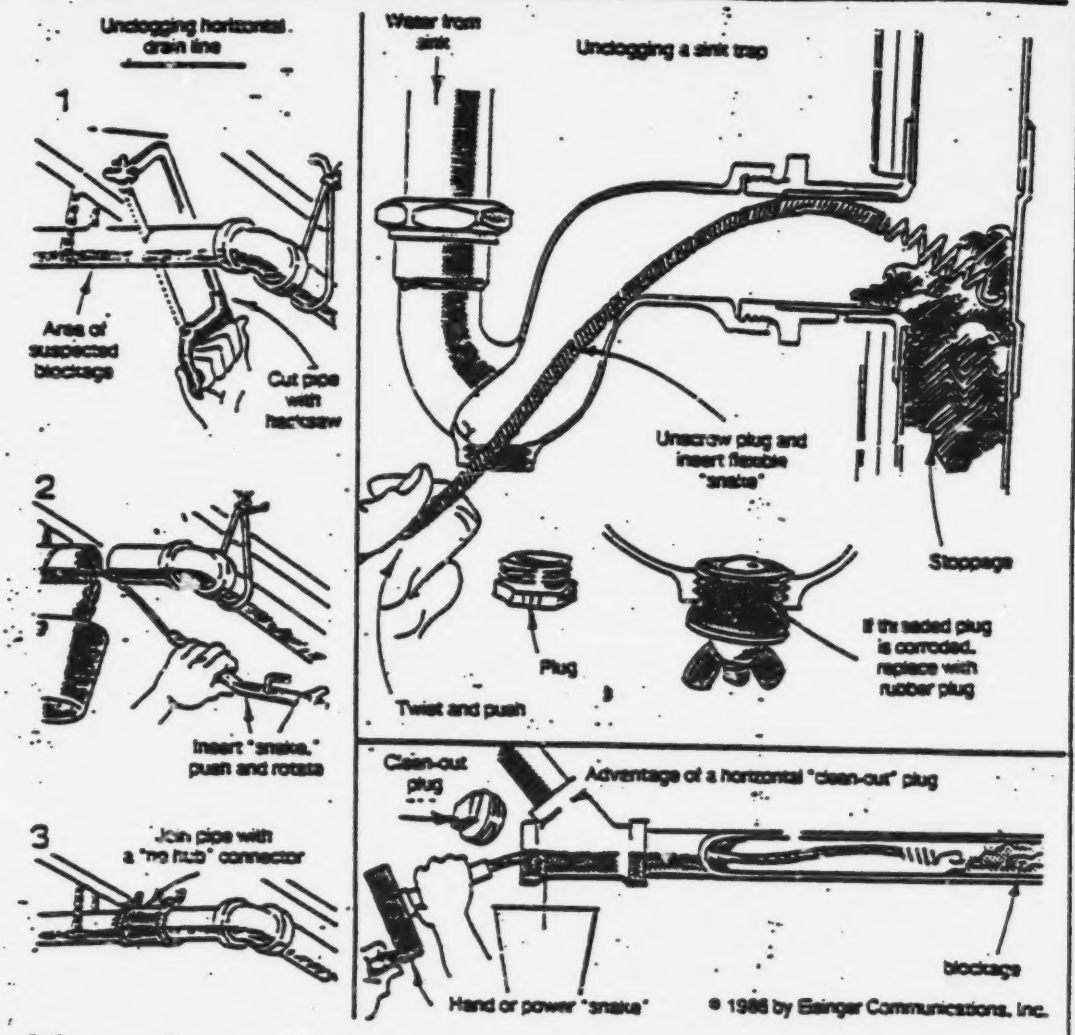


3-20. The parts of a toilet tank.



3-15. Parts of a typical compression faucet.

Workshop File By LARRY EISINGER



Keeping drains flowing — at little cost

A CLOGGED OR slow-running sink drain can be both inconvenient and expensive depending upon the circumstances. The most common plumbing problem in a home is a slow-running drain usually caused by an accumulation of hair, fat or small deoris that builds up in a trap or near an elbow.

The usual solution to dislodge the obstruction is to use a chemical drain cleaner. Some work, and some do not — it all depends upon the blockage. Chemical drain cleaners also can drain your pocketbook; you easily can calculate their cost if you follow the manufacturer's instructions on the bottle or can. For instance, it is not uncommon for a recommended dosage of a good drain cleaner to cost about 70 cents an application — and half that for a weekly dose in a sink to keep it in working order. That is more than $34 a year if you have only three sinks.

Our preferred method to keep a drain clean is to dislodge or break up the blockage with a "snake." Most traps have an access plug in the bottom: merely remove the plug and insert a flexible snake. The cost of a flexible snake is minimal and if you ever need a longer motorized one, you can rent it.

Freeing clogged traps is easy; what is not so easy is to get at a clog located in a straight length of pipe. Illustrated is a common condition of a clog located in an overhead galvanized or plastic pipe waste line. Once you have a fair idea as to the location of the obstruction by inserting a snake and noting just how far it will go, cut the pipe at that point with a hacksaw to get at the blockage from a closer point. After the blockage is broken up, connect the pipe with a "No Hub" connector available from all plumbing supply houses.

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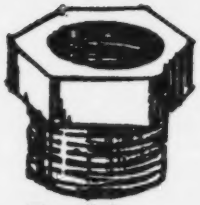
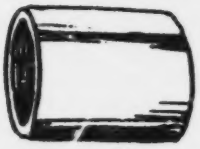
Pipe Fittings

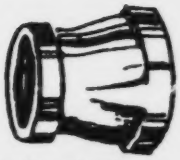


Bushing

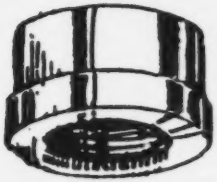
90° Elbow



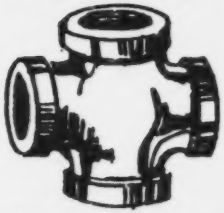
Coupling



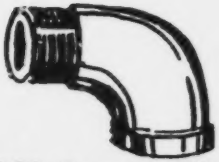
Bell Reducer



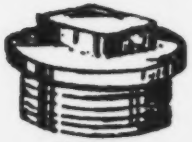
Cap



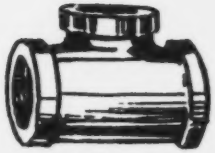
Straight Cross



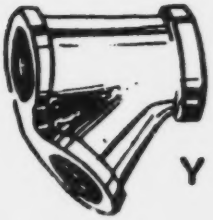
90° Street Elbow



Plug

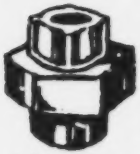


T



Y

45° Elbow

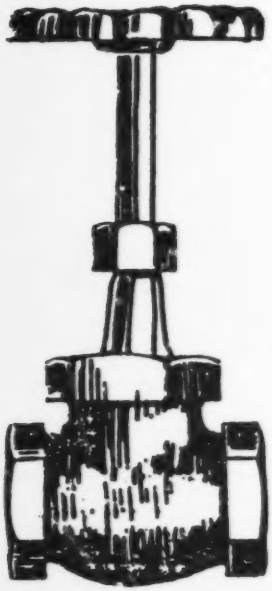


Union

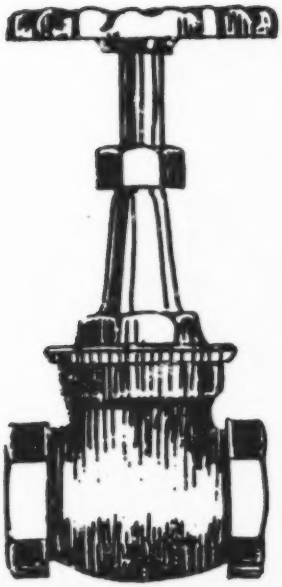
Floor Flange

Nipples

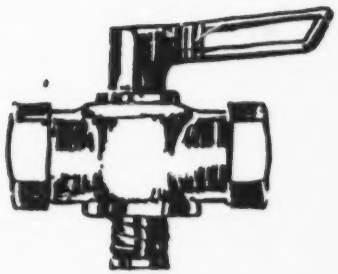
Types of Valves



Globe Valve

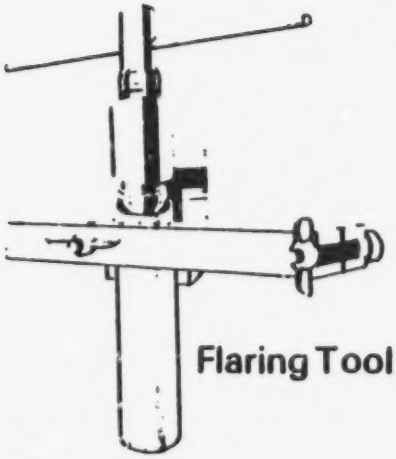


Gate Valve



Gas Stop

Plumbing Tools



Flaring Tool

Small Ratchet Threader

Bench Yoke Vise

Burr Reamer

Pipe Wrench

Chain Vise

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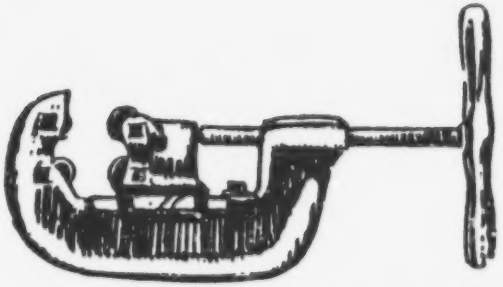
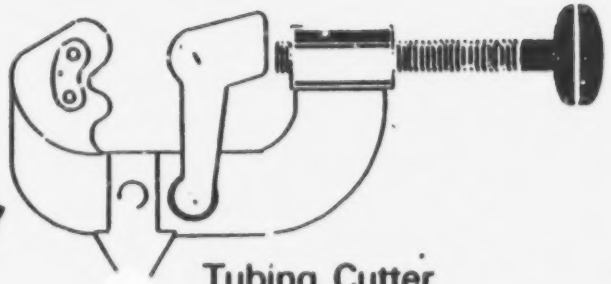
Plumbing Tools

(Continued)

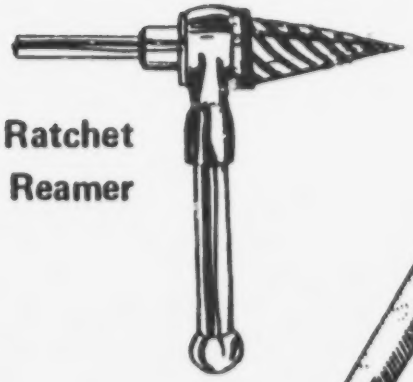


Pipe Cutter

Die

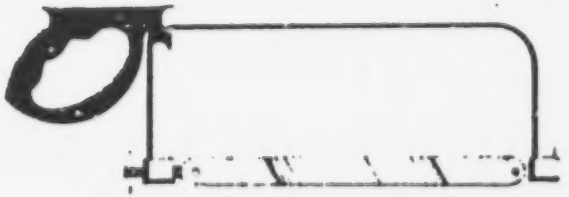


Tubing Cutter



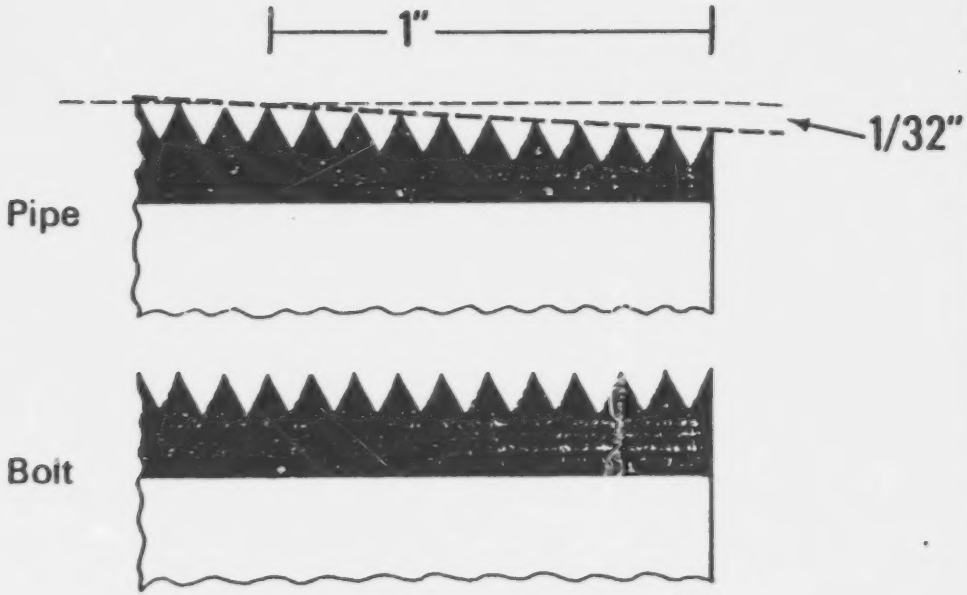
Spiral Ratchet
Pipe Reamer

Tapered Triangular
File



Hacksaw

Pipe vs Bolt Threads



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TECHNICAL GLOSSARY

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

CHAPTER III

plumbing	hệ thống dẫn, tiêu nước	水管工程
pipe breakage	ống dẫn bị bể, vỡ	送管破裂
fixtures	công trình bắt đặt	裝置物
clean-out anger or plumber's snake	khoan vệt cống hay gọi là con rắn, cửa, thợ ống nước	弧鎖式鉸工的蛇
plunger, or foce cup	đồ thông nước hay gọi là đồ hút đầy	管道清掃工具 式迫吸盆
hex wrench, or adjustable locknut wrench	mỏ lết thợ ống nước hay mỏ lết điều chỉnh	水管螺旋鉗或可可調整銷螺的螺旋鉗
faucet reseating tool	đồ sửa ổ vòi nước	水龍頭座部修補工具
adjustable open-end wrench	mỏ lết (loại thường)	螺旋鉗(普通)
faucet	đầu vòi nước	水龍頭
compression faucet	đầu vòi nước ép nén	壓縮水龍頭
washer	long đền	墊圈
packing	đệm, đế	密置
washerless faucets	đầu vòi không long đền	无墊圈水龍頭
neoprene	mot loại cao su tổng hợp	合成橡膠之一種
brass bib screw	vít đồng	銅圈螺旋
threads	răng vít	螺齒
stem packing	trục, ti vòi nước	水龍頭軸塞
cutter	đồ cắt, mài	割, 磨器
shut-off valve	xú-bắp khóa	关閉塞
toilet	cầu tiêu	廁盆
overflow pipe	ống cho nước tràn ra	溢出管
outlet valve	xú-bắp thoát nước	排水活塞

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

tank	thùng chứa nước	水槽
intake valva	xú-bắp vào nước	引入注塞
float ball	quả bóng nổi	浮球
rod	cần, cây	桿, 捍
tank LID	thùng chứa nước LID	水槽 LID
guide	trụ điều chỉnh	導桿
plunger	con lặn	拉塞
flush	cho chảy hết nước	排水
rubber tank ball	bóng cao su bịt lối nước ra	出水導接膠塞
flush handle	nút bấm cho nước chảy ra	排水把
trip arm	cần nối	長臂桿
clogged	bị tắc	阻塞
traps	ống nối (hình chữ P.S.)	P式S形接管
drains	ống tháo nước	排水管
septic tank	bể tiêu đồ bẩn	污水淨化槽
sewer	bể ngầm, cống	挖設地下水溝
out plug	nút vặn ngoài	外塞子
swing trap	ống nối hình vồng	半弧形接管
joints	chỗ nối tiếp	接合处
suction	sức hút	吸力
overflow hole	lỗ xả khi quá nhiều nước	過剩水排水口
porcelain bowl	cầu tiêu bằng sứ	磁器廁盆
crystal drain cleaner	dung,dịch hóa chất thông ống xả	清潔排水管之化学品
caustic chemicals	chất hóa học ăn mòn (hại da)	腐蝕之化学剂
closet anger	khoan vét dùng cho cầu tiêu	廁所掘金鑽

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

crank	tay quay, cán quay	曲柄
cadmiumplated bolt	bu-lông cat-mi	鍍鎘螺釘帽
penetrating oil	dầu tẩy rỉ	滲透油
hand-thread	dùng tay vặn bu-lông	用手上螺釘
sleeve clamp	kẹp đỡi	套管夾子
gasket	rong	墊圈
epoxy patching materials	nhựa dán, nối	接貼塗剂
insulation	chất cách, tách rời	隔離物
electric hair dryer	máy sấy tóc	乾髮机
open flame	ngọn lửa	火焰

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

CHAPTER III

simple	đơn giản	簡單
leaky	rỉ nước	有漏洞的
drips	chảy, nhỏ nước	滴下水
vibrating	rung động	振動的
assortment	vật tương xứng	相配
valve	bộ phận kiểm soát dòng nước	活門
decorative	trang trí	裝飾的
recess	chỗ lõm	凹處
counterclockwise	quay ngược chiều kim đồng hồ	向左旋轉
remaining	phần còn lại	剩餘的
coils	dây quấn	捲線
compress	đè nén	壓縮
contact	tiếp súc	接觸
corroded	bị ăn mòn	被侵蝕
screwed	ốc vít bắt chặt	螺絲拧紧
reassemble	lắp ráp lại	再裝配
function	tác dụng	起作用
overfill	quá đầy	裝得太滿
trickling	chảy nhỏ giọt	滴流
bent	cong	弯曲
deformed	biến hình	不成形的
waterlogged	nước vào	進水的
external	bên ngoài	外部的
tightening	thắt chặt	勒緊

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

flexible	mềm dẻo	柔軟如意
tubing	ống đựng	管子
' (foot)	ký hiệu thước của Anh	英尺的尺符號
corkscrew	xoắn hình trôn ốc	拔塞鑽
facilitate	làm cho dễ dàng	使容易
resistance	vật cản	阻物
refuse	cự tuyệt	拒絕
reasonable effort	nỗ lực thích đáng	適当的努力
under pressure	dưới áp lực	压力下
approximate	ước chừng	估計
expand	nở ra, phồng ra	伸展
thaw	làm cho tan đá	融解
steam	hơi nước	水蒸汽
bare hand	tay không	空手
gradual process	tiến hành lần lần	漸進過程

PLASTER AND DRYWALL

Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 4 - Plaster and Dry Wall Repair

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Barnett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 4 , pages 65 - 71

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. Mix spackling compound and repair cracks in plaster and drywall 2. Repair a small hole in plaster and drywall 3. Repair a large hole in plaster and drywall	see Glossary	see Glossary	1. Rather than demonstrate on a small piece of drywall in class, find a house that needs fixing and demonstrate there 2. The students can be responsible for finding neighbors or friends that have holes or cracks that need repairing and practicing on those 3. Also check with the maintenance department at your school to see if your class can watch and/or help them do some plaster or drywall repairs

Length of Lesson	Evaluation	Materials and Notes
2 weeks	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

TECHNICAL GLOSSARY

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

CHAPTER IV

dry-wall	mặt tường làm bằng giấy hoặc thạch câm	.软板或石棉的墙面
plaster	hồ	膠泥
gypsum panels	ván thạch cao	石膏鑲板
vallboard compound	ván tường nhân tạo hỗn hợp	人造壁板混合物
two coats	hai lớp hồ	雙層膜
cement base	cốt xi-măng	水泥底
wire lath	dây thép cốt	鐵絲條
gypsum lath	ván mỏng thạch cao	石膏板條
studs	trụ, cột	間柱
spackling compound	một loại hồ để trát tường	一种修理牆的混合料
undercut	cắt sâu vào phần dưới	切去下部
tin ships	kéo mạ thiếc	鍚鏡剪
loop of string	dây xoắn	圈線
perforated reinforcing tape	thước cuộn (hộp)	卷尺(盒)
straightedge	thước kẻ	直尺
plasterboard nails	đinh đóng gỗ tường	牆釘
"feather out"	dần mỏng, đều hồ	划平漿面
primed	sơn lót	底色

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

CHAPTER IV

construction	kiến trúc	建築
smooth appearance	bề ngoài bóng, nhẵn	外表平滑
seams	đường nối	縫合線
corners	góc, cạnh	边.角
first step	việc đầu tiên	第一步
prepared	đã phối chế	配製
disposable	sử lý theo ý muốn	可任意處理
absorption	hấp thụ	吸收
rapidly	nhanh chóng	快速
shrink	co, rút nhỏ lại	縮小
stuffing	nhồi, nhét	填塞
wads	bông nhét	填棉
rectangular	hình chữ nhật	長方形
knot	đánh nút dây	结節
tourniquet	thắt chặt	駁壓器
overnight	qua đêm	过夜的
existing	hiện tại	現存的
wrinkles	vết nhăn	皺紋
air pockets	túi hơi	氣泡
blending	pha trộn	混合

REDECORATING WITH PAINT

Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 5 - Redecorating With Paint

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Barnett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 5 , pages 72 - 93

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. List the names of the basic types of interior and exterior paints and know the components of each 2. List the materials used to clean brushes used in each type of paint 3. Recite 3 different roller-cover materials, and 3 different types of rollers 4. Set up a ladder safely figuring the base distance based on the height 5. Estimate the amount of paint needed for a job 6. Recite the steps necessary to prepare an interior and exterior for painting	see Glossary	see Glossary	1. Generally most students will say they have all done painting before but most have no idea how to do a professional looking job 2. An emphasis, as usual, needs to be placed on getting as much "hands on" experience as possible. This will enable the student to remember these skills for years to come

Length of Lesson	Evaluation	Materials and Notes
1-2 weeks	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

TECHNICAL GLOSSARY

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

CHAPTER V

paneling	ván bịt	鑲板
vinyl	một loại nhựa	乙烯塑膠
tile	gạch hoa	花磚
asphalt	nhựa lịch-thanh	瀝青
lincleum	vải dầu	油布
sills	bực cửa	窗台
ducts	ống dẫn	導管
flat	bằng mặt	平面
semigloss	sơn bóng vừa	半光彩
ename	sơn bóng	亮漆
oil	dầu	油
alkyd	sơn alkyd	烷基
latex	nhũ-dịch	乳液
calcimine	sơn calcimine	白式着色水溶料
shutters	cửa chớp	百葉窗
awnings	bạt che nắng	涼蓬
galvanized	mạ thiếc	鍍鋅
gloss	sơn bóng	光澤
heel	nơi khuất, gót	根底
ferrule	đầu bịt kim thuộc	金屬環
spirit solvent	cồn rửa (sơn)	酒精溶剂
linseed oil	dầu hột gai	亞麻子油
rollers	ống lăn	滾筒
polyurethane	chất polyurethane	聚亞胺酯

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

polyester	chất polyester	多元酯
nylon	chất nylon	尼龍
trim rollers	ống lăn làm gọn	整潔用滾筒
corner rollers	ống lăn góc cạnh	边角用滾筒
segmented rollers	ống lăn từng đoạn	部份用滾筒
doughnut-shaped rollers	ống lăn hình bánh doughnut	圓形滾筒
baseboards	chân tường	牆脚
short-nap	lông ngắn	短毛
long-nap	lông dài	長毛
cedar shakes	đường nứt gỗ bạch dương	杉木裂縫
stepladder	thang bốn chân	四脚梯
extension ladder	thang duỗi rút	伸縮梯
rung	bực thang	梯子的橫木
ladder stand-off	đồ gắn trên thang để giảm độ ma xát giữa thang với tường	隔離梯子和牆摩擦的東西
scraper	đồ nạo	拆除用具
caulking gun	súng xảm (khe hở)	填隙槍
caulking cartridges	ống xảm	填隙筒
glazing compound	hóa chất làng bóng	光滑剂
primer	lớp sơn đầu	底漆
shellac	cánh kiến	虫漆
knots	nút, gút dây	结節
drop cloths	vải rải đất (che sơn)	蓋地布
spot prime	trước nhất bịt hết lỗ đinh	先把釘眼处填平
putty	mát-tít	油灰

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

pitch	nhựa cây	樹脂
eaves	mái hiên	屋簷
gutters	máng nước (phần trên)	排水管(上段)
downspouts	máng nước (phần dưới)	排水管(下段)
run a bead	bơm (ma tít) hình trăng hạt châu	串珠形填塞法
chimney	ống khói	煙囪
undercoat	lớp sơn gốc	內層油漆
sash	khung cửa, khung cửa sổ	窗框
pad applicator	nệm nhỏ	通用墊子
gables	đầu hồi nhà (tam giác)	山形牆
square feet	thước vuông	平方尺
pigment	màu, sắc-tố	顏料
curtains	màn gió	窗帘
drapes	màn dạ, nỉ	幔.窗帘
shades	mành mành (treo ở cửa sổ)	陽篷
venetian blinds	mành sắt	活动百葉窗
switch plates	miếng sắt đậy công tắc	电开关金屬板
outlet covers	vật đậy ổ cắm	插座蓋
doorknobs	quả đấm cửa	門户的把柄
masking tape	băng che	掩藏膠帶
dustpan	máng hứng bụi, sơn	簸箕

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

CHAPTER V

subdued	làm cho dịu bớt màu	.把色彩減和
pastel	màu dịu nhẹ	淡白柔和的顏色
elastic	sức co dãn	彈性的
bristles	lông bút sơn	漆筆毛
springy	có sức co dãn	有彈力的
horizontally	mặt ngang	橫的
vertically	mặt dọc	垂直的
clear	trong	透明
palms	bàn tay	手掌
mark	lấy dấu, vết	標誌
lukewarm	âm ấm	微溫的
evaporating	bay hơi	汽消散
saturate	thấm vào	使滲透
pliable	mềm dẻo	柔軟
extension	kéo dài thêm	伸展
ladder	thang	梯子
excess	quá nhiều	過多
overreach	quá với tới	過度伸張
insure rigidity	bảo đảm cứng thẳng	確保勁直
one quarter	một phần tư	四分之一
height	độ cao	高度
base	phần dưới	底部
nonskid	không trơn đi	免滑
grasping	cầm giữ	抓住
required	cần thiết	必需

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

prepared	chuẩn bị	已準備
peel	bong rụng	脫落
sound footing	chân đặt chắc chắn	堅固立足處
spattered	vung vãi	濺潑
rotted	mục nát	腐蝕
manufacturer	xưởng chế tạo	制造者
oozed	rỉ ra	滲出
gaps	lỗ, kẽ hở	裂縫
bare	trần	裸的
scale	vảy mỏng	薄片
estimate	đánh giá, đinh giá	估計
perimeter	chu vi	周圍
label	nhãn hiệu	標貼
coverage	phạm vi bao quát	所包括的範圍
divide	chia ra	除(數)
striated	có đường sọc	有條紋的
stirrer	cây ngoáy	攪拌用杓子
systematic	có hệ thống	系統的
spills	vung vãi	潑掉
furniture	bàn ghế	家俱
soiled	đồ bẩn	污物
greasy	dầu, mỡ	多油的
detergent	thuốc rửa	清潔剂
adhere	bám chặt	黏着
imperfections	khuyết điểm	缺點
area	diện tích	面積
pint	đơn vị để đo lường thể lỏng	品脫(液量單位)

REDECORATING W/WALL COVERINGS

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 6 - Redecorating with Wallcoverings

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Barnett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 6 , pages 99 - 104

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. Recite the six types of wallcoverings mentioned 2. Identify the steps in preparing a painted or wallpapered wall for wallpapering 3. Identify the tools and materials used in hanging wallcoverings 4. Recite the steps followed when hanging wallcoverings	see Glossary	see Glossary	1. Keep in mind that if the goal is to train the students to go into apartment maintenance, wallcoverings will not be commonly used 2. If actual hands on experience cannot be done, try to bring in a few samples from a local wallcovering store

Length of Lesson	Evaluation	Materials and Notes
1 week	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	180

126 179 126

TECHNICAL GLOSSARY

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

CHAPTER VI

wallcoverings	giấy tường	牆紙
textile backed	nền vải	布底
prepasted	đã có hồ sẵn	已有漿粘A
self-adhering	tự dính	自黏
vinyl-covered	bao phủ bằng chất vinyl	乙烯基蓋覆
foil-coat	che bằng chất foil	箔处膜
plasticized	chất nhựa	塑膠的
flocked	chất bông, len	毛.絨屑
wallpaper steamer	máy phun hơi nước dùng cho giấy tường	牆紙噴蒸汽机
stripper knife	dao rạch	剝刀
paste brush	chổi phết hồ	漿糊筆
smooth brush	chổi mặt phẳng	平滑毛刷
cheesecloth	vải lọc hồ	漿糊過濾布
seam roller	ống lăn dùng cho đường nối	接口用的滾筒
metal straightedge	thước thang bằng kim loại	金屬直尺
chalk line reel	ống cuốn dây phấn	粉筆線捲筒
molding	chỗ lồi lõm	凹凸形
doorframe	khung cửa	門架
casing	khung cửa sổ	框子
soffit	mặt dưới của khung vòm	背面(廊柱)
plank	ván kê	鋪板

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

CHAPTER VI

pasted	dùng hồ để dán	.用漿糊粘
untrimmed	chưa cắt xén	沒修剪
time-consuming	thời gian tiêu dùng	消耗时间
chart	đồ-biểu	表
consult	tham khảo	請教
round off	số năm trở lên cộng vào, năm trở xuống trừ đi	取近数(計算)
aware	đoán trước, biết trước	晓得
dents	chỗ lõm	凹處
ruining	làm hỏng	弄坏
loose	lỏng lẻo	不緊的
ripped	cắt bỏ	割掉
white glue	keo dán màu trắng	白膠
contact	tiếp xúc	接觸
strippable	có thể xé bỏ được	可剥掉的
hose	ống dẫn nước	水管
soaking	làm thấm nước	浸,泡
nonporous	chống ẩm	防浸透
slash	rạch	开叉
criss-cross fashion	rạch hình chữ thập	十字形开叉方法
stubborn	ương ngạnh	頑固的
printing errors	nhầm lẫn khi in	印刷過失
reroll	cuộn lại	再捲起
intersecting	nối giao tiếp	相交,交叉
snap	bật lại	反弹

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

layer	đồ che, lót	置放物
consistency	độ dính	黏度
lumps	cục lớn	塊狀
sufficient	vừa đủ	足夠
overlapping	dán đè lên	重疊
butts	tiếp ráp	隣接
perfectly	hoàn hảo	完整地
insure	chắc chắn	确保
diagonally	chéo góc	斜对地
inconspicuous spot	nơi khuất kín	不顯眼的地方
dimension	kích thước	尺寸
fragile	mỏng manh	脆弱
immerse	ngâm	浸

Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 7 - Redecorating Floors

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Bennett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 7 , pages 105 - 126

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. Identify the four main types of woods used in flooring 2. Name the steps involved in repairing and refinishing a wood floor 3. Recite the six different types of concrete paint 4. List the steps that should be followed when installing resilient floor tiles 5. Plan out on paper the center lines and tile rows and estimate the number or amount of tiles needed for a room or job	see Glossary	see Glossary	1. Many people would be willing to spend the money for new flooring if they don't have to pay for the labor to install it. Make an effort to find a site where the students can get some "hands on" experience

Length of Lesson	Evaluation	Materials and Notes
1-2 weeks	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

TECHNICAL GLOSSARY

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 7

oak
maple
birch
pine
sub-floor
plywood panels
tongue and grooved
raw wood
refinished
putty
parquet
stain
white shellac
alcohol
basements
garages
polyvinyl Acetate
silicon sealer
emulsion
Portland cement
efflorescence
muriatic acid
resilient floor
tile
sheet vinyl
linoleum
"tooth"
roofing felt
underlayment
rosin-coated nails
cement-coated nails
annular ring nails

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 7

spotnailer
masonite
knee pads
cork
metal moldings
score
notched spreader
notched trowel
lawn roller
aviation shears
spiral-grooved nails
predrilled holes
self-stick tiles
carpet squares
stiff putty knife

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

Chapter 7

luster
ventilation
invisible
split
progressively
drape
minor imperfections
divergent
accustom
staggered
continuous seams
expansion
contraction
suitable
self-stick
suitable
gauge
nominal fee
brittle
flexible
perpendicular
quadrant
tacky
border
pattern
absolutely necessary
slightly
patch
irregular pattern
curves
electric clothes iron
nearby

FASTENERS AND OTHER HARDWARE

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 8 - Fasteners & other Handward

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Barnett & McKnight, Glencoe Publ. Co., Encino, CA., 1985

Chapter 8 , pages 127 - 144

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
Student will be able to: 1. Identify on sight common nail sizes, such as: 4d, 6d, 8d, 10d, 16d, 20d 2. List 10 different types of nails, 3 types of wood screws, 6 types of wall fasteners, 5 types of screw hooks, 4 types of bolts, 5 types of nuts, 8 types of hinges, 10 types of door hardware, and 5 types of miscellaneous hardware	see Glossary	see Glossary	1. A fun activity for this section is to obtain as many of these pieces of fasteners and hardware as possible and put them in a cardboard box. Cut a hole just large enough to put a fist through and hve the students take turns pulling out the different items and then saying their name and use

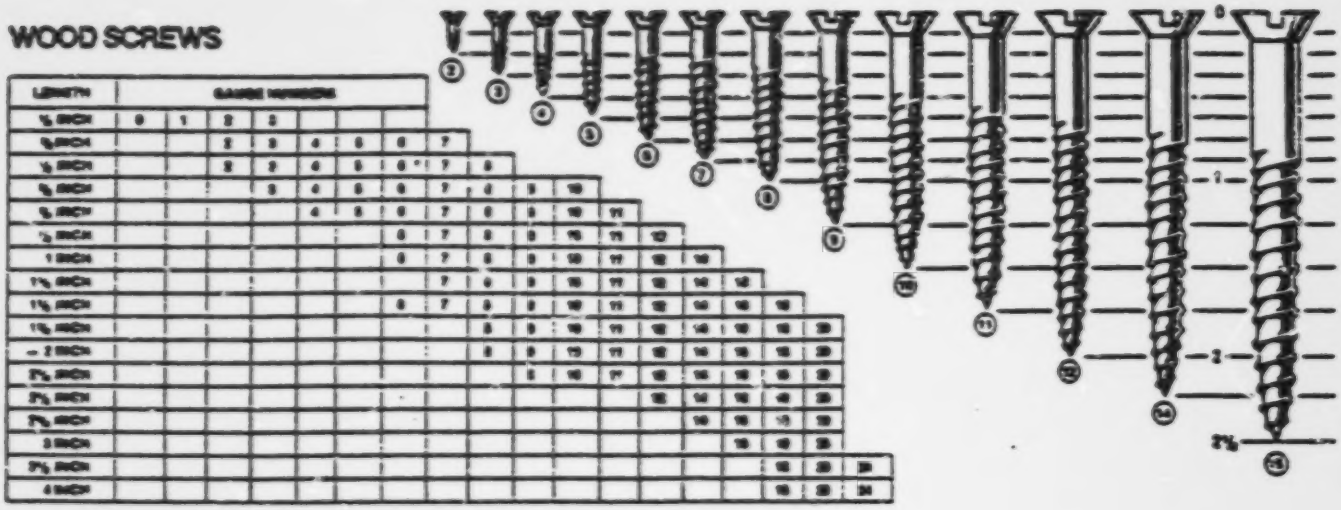
Length of Lesson	Evaluation	Materials and Notes
1-2 weeks	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

TEACHING MATERIALS

Popular Mechanics Shop Guide

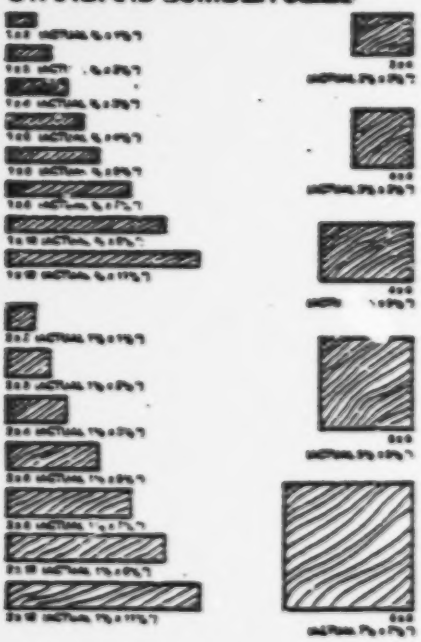
And Metric Conversion Charts

WOOD SCREWS

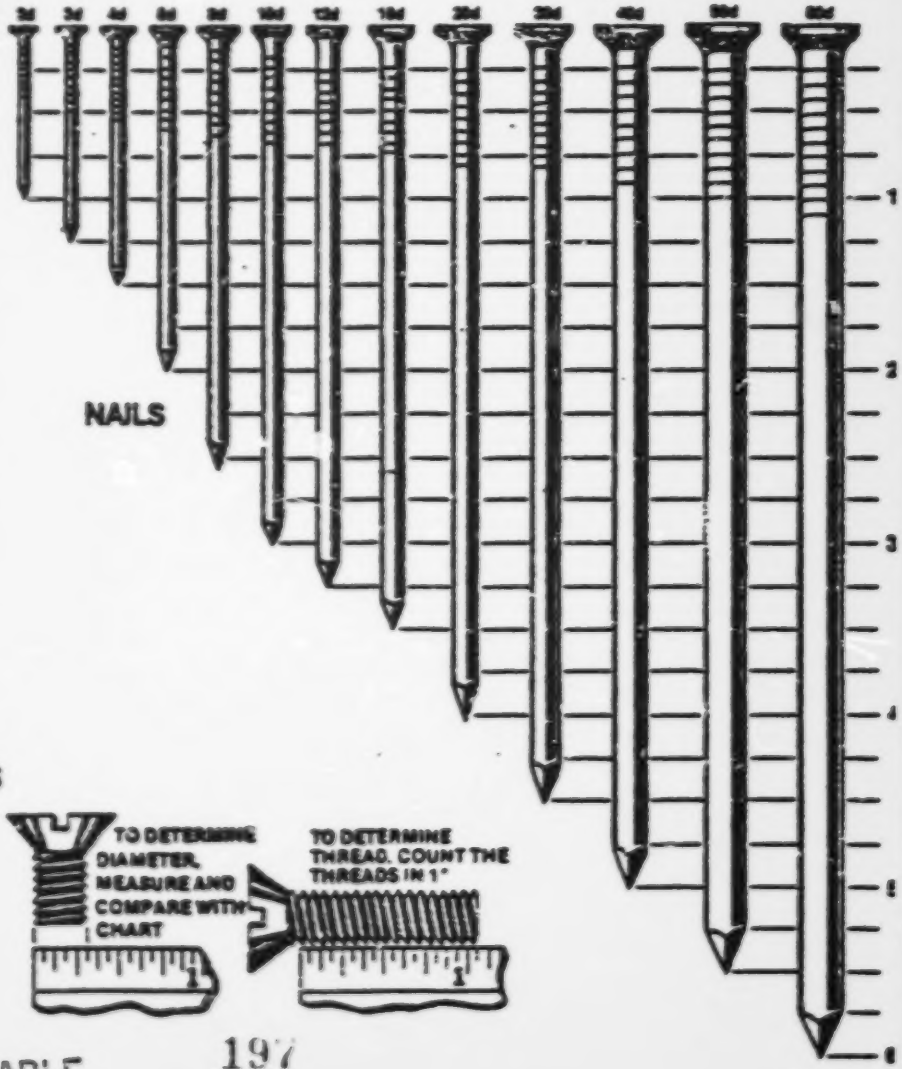


WHEN YOU BUY SCREWS, SPECIFY (1) LENGTH, (2) GAUGE NUMBER, (3) TYPE OF HEAD—FLAT, ROUND, OR OVAL, (4) MATERIAL—STEEL, BRASS, BRONZE, ETC., (5) FINISH—BRIGHT, STEEL, BLUED, CADMIUM, NICKEL, OR CHROMIUM PLATED.

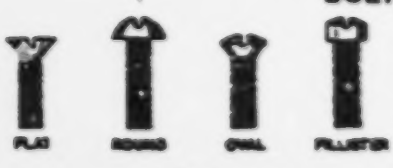
STANDARD LUMBER SIZES



NAILS



BOLTS



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TECHNICAL GLOSSARY

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 8

hardware
nails
screws
bolts
doorknobs
hinges
closing devices
iron
steel
zinc
galvanized
resin
aluminum
penny system
common
finishing
brads
casing
cut
annular ring
spiral
concrete
roofing
box
wood screws
brass
zinc chromate
cadmium
copper
thicknesses (gauges)
flathead
ovalhead
roundheaded
slotted

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 8

recessed (Phillips) heads
one-way screw
countersink
awl
metric
customary-inch
recess
C-clamp
pilot hole
machine screws
hexagonal
square
metric thread
pitch
tightness
class of fit
sheet metal screws
self-tapping
wall fasteners
collapsible hollow-wall screw anchors
toggle bolts
plastic anchors or plugs
machine-screw expansion lead anchors
fiber anchors with lead center
lasead lag-screw expansion plugs
outside diameter
grippers
gravity
racks
shelves
carbide-tipped masonry drill
star drill
screw hooks

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 8

bolts
washers
nuts
hinges
door hardware
cup hooks
screw hook
screw eye
hook and eye
square-bend screw hook or L hook
machine bolts
stove bolts
lag bolts or screws
carriage bolts
spring-lock washer
hexagonal nut
square nut
wing nut
locknut
castle nut
knuckle
butt hinges
mortises
spring loaded
semiconcealed
H hing
HL hinge
strap hinge
T hinge
continuous hinge
piano hinge
latch
barrel bolt
chain door fastener
spring doorstop

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 8

rigid doorstop
knobs
door pulls
friction catch
single-roller catch
magnet catch
hasp and staple
sash lock
sash lift
corrugated fasteners
metal-mending plates
staples

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

Chapter 8

designation
previously
accommodate
technique
tapping
tapered
hit squarely
occurrence
partially concealed
miscellaneous

DOOR REPAIRS

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 9 - Door Repairs

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Barnett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 9 , pages 145 - 161

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to:	see Glossary	see Glossary	
1. Identify the various styles of interior and exterior doors			1. It is important that each student gets the chance to install and remove a lock from a door. Ask your local locksmith for some old locks. Perhaps he would also be willing to give a talk on some of the most common problems he comes across
2. Recite the common door problems and how to solve them			2. Find someone who wants some weather stripping installed
3. Install different varieties of weather stripping			
4. Name the three major types of locks found on doors in a house or apartment			
5. List the steps involved in installing a new lock			

Length of Lesson

2 weeks

Evaluation

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures

Materials and Notes

~~246~~ 150

~~247~~

TESTS

PROPERTY MANAGEMENT AND MAINTENANCE
Ch. 9 Door Repair Quiz

1. Q: What are three types of doors?

   A: 1) panel; 2) flush; 3) Dutch

2. Q: What are three common lock problems? (p. 154)

   A: 1) the key does not go into the lock easily
   2) the key turns without opening it
   3) a broken key in the lock

3. Q: What are the types of weather stripping available?

   A: 1) sweeps and threshold
   2) felt stripping
   3) flexible rubber or vinyl strips

4. Q: What are the common problems with sliding doors?

   A: 1) an obstruction in the track
   2) dirty or bent tracks or guides
   3) one wheel out of adjustment

5. Q: What are the three major types of locks found on the doors in a house?

   A: 1) mortise lock
   2) cylindrical lock
   3) tubular lock

6. Q: What do you do when the key does not go into the lock easily?

   A. This problem is solved by squirting some powered graphite or graphite in oil into the keyway

7. Q: What do you do before cutting a door with a curcular saw to prevent the outside wood covering on the door from splitting?

   A: Score the door on the line with a utility knife

TECHNICAL GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY
Chapter 9

hollow core flush doors
French doors
panel doors
louvered doors
weather-stripped
solid flush doors
building codes
Dutch doors
welded
out of square
shimming
latch plate
planing
jambs
header
spring latch
flush
sweeps
threshold strips
felt stripping
track
interlocking weather stripping
two-or-four-panel set
pivot
alignment
pivot sockets
hexagonal-shaped
powdered graphite
keyway
jeweler's saw
locksmith
mortise lock
cylindrical lock
tubular lock
chains
sliding bolts

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 9

night latches

dead-bolt locks

square spindle

rosette

mechanism

expansive bit

template

high pile

shag rug

low pile

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

Chapter 9

drafts
moisture
localities
fire resistant
stick
swelling
warped
analyze
binds
jiggle
rules
knuckles
settles
remedies
reposition
compresses
accomodace
drag
lean
entry
privacy
squirting
clear
raised
designed
activity
attempt
cylinder
dislodge it
device
varieties
auxiliary
avoid
trace
engages

Chapter 9

outer position

clearance

satisfied

WINDOW REPAIRS

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 10 - Window Repairs

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Bennett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 10 , pages 162 - 178

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. List the types of windows and pick out the ones that can be most easily repaired 2. List the steps in replacing a broken sash cord or chain in a double hung window 3. Recite the steps in repairing the mechanism on a casement window 4. Identify the tools needed to replace a broken window pane 5. Describe the steps followed in replacing a window screen and the tools needed 6. Demonstrate how to patch a screen	see Glossary	see Glossary	1. Chances are that there are a lot of broken windows on a variety of different types of windows at your school. Find out who repairs them and ask if you can watch and even help 2. Ask the glazier if you can take the broken pieces for the students to practice cutting on

Length of Lesson	Evaluation	Materials and Notes
2 weeks	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

TECHNICAL GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 10

bow window
bay window
double-hung
sash weights
casement
awning
jalousie
sliding
picture
stop molding
window sill
paraffin
silicone
sanding block
sash pocket cover
snap link
pulley
worm gear
light machine oil
gear housing
lever arm
safety glass
tempered glass
glazier
glazing compound
pane
rope-type caulking
glazier's points
clips
metal sash
bead
grease pencil
china marker

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 10

crayon

felt-tip marker

glass cutter

window screens

tin snips or scissors

staple gun

mesh

rabbet

neoprene spline

screening tool

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

Chapter 10

arranged singly
pairs
balanced
cords
viewing
scrap
lumps
distribute
malfunction
access
loop
visible
groove
prop up
sagging
attach
contract
presses
substitutes
temporarily
pliable
chip out
slightly
softens
pry
rags
seal
accurately
channels
excess
overlap
index finger

snap off cleanly

standard widths

by the foot

trim off

strands

EXTERIOR CARPENTRY REPAIRS

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 11 - Exterior Carpentry Repairs

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Burnett & McKnight, Glencoe Publ. Co., Encino, CA., 1985

Chapter 11 , pages 179 - 200

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. Identify the four major types of roofing materials 2. Remove and replace a defective wood or asphalt shingle from a roof 3. Name the major types of wood siding and non-wood siding 4. List the tools needed when replacing wood siding 5. Load, cut puncture, and properly operate a caulking gun & cartridge 6. Make up a parts list needed for assembling a simple gutter and downspout	see Glossary	see Glossary	1. Find a roofer who doesn't mind you and your students practising on a roof that he is about to tear off anyway 2. Give each student a damaged portion of the roof that he/she must repair

Length of Lesson	Evaluation	Materials and Notes
2 weeks	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

TECHNICAL GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 11

sloping
clay tiles
ceramic tiles
rolled roofing felt
roofing paper
paper or wood fibers
flat roofs
asphalt shingles
mineral chips
wood shingles or shakes
cedar
roof sheathing
attic floor
rafters
plumbing vent
pipes
valleys in the roof
peak or ridge of the roof
metal flashing
cap
ridge
course or row
roofing cement
self-sealing
heat-activitated adhesive
waterproof joint
U-shaped
furring strips
predrilled holes
nailheads
roof vents
beveled siding
tongue-and-groove siding
drop siding
rustic (novelty) siding
exterior plywood siding

wrecking bar
wedge
tar paper
face nailing
strike it
sharp blow
shingle cutter
nibbler
fascia
back-prime
wire brush
rope-type caulking
gutters
downspouts
troughs
spikes
ferrules
roof hangers
wrap-around hangers
cold tar
soldered
seal
mastic
blind riveting tool
outlet tube
end caps
pitch

RELATED GENERAL GLOSSARY

location
hidden
weather conditions
ideally
brittle
impregnated
fire resistance
inspecting
leak
stains
puddles
not quite
able to spot
loose
actual
assemble
tips
slot
stagger
crushes
shifting
concave portion
upraised sides
hooks
blister
neat
placement
minimum
tool rental agency
punches
transfer
rotting
scrape out
fastened
collect
cavity

puncture

debris

blockage

directing

spray

ORDERING LUMBER & BUILDING MATERIALS

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 12 - Ordering Lumber & Other Building Materials

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Barnett & McKnight, Glencoe Publ. Co., Encino, CA., 1985

Chapter 12 , pages 201 - 210

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. Identify on sight common hardwoods and softwoods 2. Classify any type wood as a gardwood or softwood 3. List the grades from best to worst for hardwoods and softwoods 4. Figure out the actual size of a piece of wood given its nominal size 5. Recite the grade of plywood from best to worst 6. Read a back-stamp on a piece of plywood 7. Distinguish plywood from particle board or hardboard 8. Identify the different types of molding and their uses	see Glossary	see Glossary	1. Go to a lumberyard and get scraps of as many different types of wood as possible. Then have the students practice identifying them 2. Take a field trip to a lumberyard to see how lumber is orgnaized and graded

Length of Lesson	Evaluation	Materials and Notes
1 week	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

TEACHING MATERIALS

How lumber is measured and sold

Lumber prices are figured by the board foot for ordinary lumber. A board foot is the amount of lumber in a piece 1 inch thick, 1 foot wide, and 1 foot long. Thus a piece an inch thick, 6 inches wide, and 10 feet long will contain 5 board feet.

As the drying and milling process reduces the thickness of the lumber, however, you really don't get a piece a full inch thick—even though it's expressed that way for convenience.

The result is that 1-inch lumber really means 25/32-inch. From 2 inches to 6 inches, the actual dimension is ⅜ inch less than the expressed dimension; that is, a 2x6 is really 1⅝ inches thick and 5⅝ inches wide. Boards 8 inches wide and up drop a full half-inch; an 8-inch board is really 7½ inches wide.

If you want your lumber to be a full inch thick, you'll have to specify and pay for next size, usually 1¼ inch.

When you make up your lumber list, avoid mistakes by writing down the number of pieces first, the thickness next, then the width, length, grade, and species, followed by whether you want it rough or smooth.

Thus, if you want two pieces of top-quality white oak an inch thick, 6 inches wide, and 10 feet long, smooth on both sides and on both edges, write it this way: 2-1x6-10-Firs-Wh Oak-S4S. The "Firs" means first and seconds, the top grade in hardwood. The "S4S" means you want the lumber surfaced on all four sides.

Some lumber, such as shingles and laths, comes in bunches, can't be bought one at a time. Moldings are sold by the running foot, as are both closet poles and stair railings. Ready-made units like windows and doors are priced according to size and type. And for materials like plywood or wallboard, the price is figured by square foot or panel.

Lumber sizes. As the carpenter's square shows, this mark 2x4 actually measures only 1⅝ inches by 3⅝ inches. At the left, the bottom board is a rough 1x6 which actually measures that. Above it is a finished 1x6 smoothed on all four sides; assuming caused slight shrinkage, then milling smoothed the surfaces and removed a layer of wood during it.

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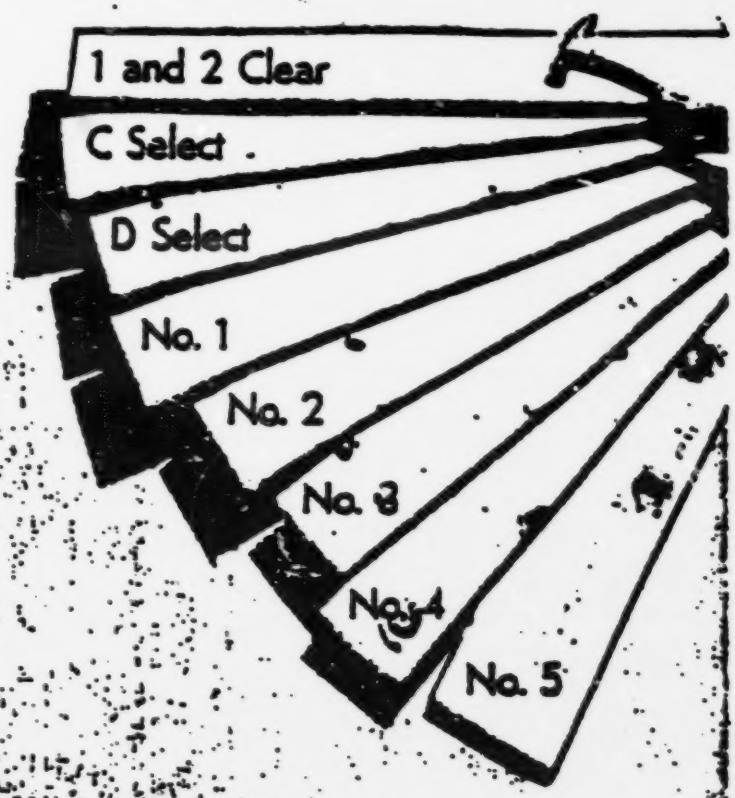
1 & 2 Clear (also called firsts and seconds, or B&Better) is highest quality, almost free of blemishes. Use is for finest cabinetwork. C Select runs next in quality and price, may have fine knots and minor imperfections. Often one side is without blemishes. D Select, lowest of the finishing grades, is a fine all-round wood for workshop projects. No. 1, first of the board grades, is a good general-purpose wood. It may have small, sound knots, takes paint well. No. 2 is an all-round utility grade, often used for knotty panelling or flooring. No. 3 occasionally has knotholes, plus limited amounts of pitch and season checking. No. 4 is the lowest board grade that most home handymen are likely to use. Low cost makes it useful for a temporary structure. No. 5 is the poorest quality, with many imperfections, but cheap. Use is when you create something, and need neither strength nor beauty.



How lumber is graded

You can save money and get better results on your home repair jobs and workshop projects if you order your lumber as carefully as your groceries. Like eggs and milk, lumber is graded according to quality.

Grading methods vary, but the woods you'll use most often will probably be graded approximately like the pine boards pictured. For hardwoods, the corresponding grades might be labeled firsts and seconds, selects, No. 1 common, No. 2 common, sound wormy, No. 3A common, and No. 3B common.

Whenever you buy lumber, save money by buying the least expensive grade that will serve your purpose. Don't buy finishing grades, for example, unless you're really going to do a finishing job with it. Explain your plans carefully to the salesman.

Your project will determine the species of wood you want. Stocks in lumberyards vary, too, depending on local availability and demand. For general construction work, softwoods are usually chosen, such as pine, fir, spruce, cypress, cedar, redwood, or hemlock. For trim, floors, cabinets, or furniture, you may decide to use either softwood or one of the hardwoods, such as oak, maple, mahogany, gum, walnut, or beech.

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Lumber data

Nominal size, inches	Actual size, inches	Board foot per foot of length
1x2	25/32 x 1½	⅙
1x4	25/32 x 3½	⅓
1x6	25/32 x 5½	½
1x10	25/32 x 9½	⅚
1x12	25/32 x 11½	1
2x4	1½ x 3½	⅔
2x6	1½ x 5½	1
2x10	1½ x 9½	1⅔
2x12	1½ x 11½	2
3x6	2½ x 5½	1½
4x4	3½ x 3½	1⅓
4x6	3½ x 5½	2

Softwoods, *used mainly for structural work and millwork*

Easy to work: Cedar, redwood, spruce, white pine
Resists shrinking, swelling, warping: Cedar, cypress, redwood, spruce, white pine
Finishes well: Cedar, cypress, fir, hemlock, redwood, spruce, yellow pine, white pine
Unusual strength: Douglas fir, yellow pine, western larch
Natural resistance to decay: Cedar, cypress, redwood, white pine

Hardwoods, *used mainly for furniture and interior trim*

Easy to work: Basswood, gum, mahogany, poplar, walnut
Resists shrinking, swelling, warping: Mahogany, walnut
Finishes well: Beech, birch, gum, mahogany, maple, oak, walnut
Unusual strength: Ash, beech, birch, hickory, oak
Open grain: Mahogany, oak, walnut

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METRIC CONVERSION FACTORS (Approximate)

Conversions TO Metric Measures

	Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH	in	inches	2.54	centimeters	cm
	ft	feet	30.48	centimeters	cm
	yd	yards	0.9	meters	m
	mi	miles	1.6	kilometers	km
AREA	in^2	square inches	6.5	square centimeters	cm^2
	ft^2	square feet	0.09	square meters	m^2
	yd^2	square yards	0.8	square meters	m^2
	mi^2	square miles	2.6	square kilometers	km^2
		acres	0.4	hectares	ha
MASS (Weight)	oz	ounces	28	grams	g
	lb	pounds	0.45	kilograms	kg
		short tons (2000 lb)	0.9	tonnes	t
VOLUME	tsp	teaspoons	5	milliliters	ml
	Tbsp	tablespoons	15	milliliters	ml
	fl oz	fluid ounces	30	milliliters	ml
	c	cups	0.24	liters	l
	pt	pints	0.47	liters	l
	qt	quarts	0.95	liters	l
	gal	gallons	3.8	liters	l
	ft^3	cubic feet	0.03	cubic meters	m^3
	yd^3	cubic yards	0.76	cubic meters	m^3
TEMP. $C = \frac{5}{9}(F - 32)$	°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

Conversions FROM Metric Measures

	Symbol	When You Know	Multiply By	To Find	Symbol
LENGTH	mm	millimeters	0.04	inches	in
	cm	centimeters	0.4	inches	in
	m	meters	3.3	feet	ft
	m	meters	1.1	yards	yd
	km	kilometers	0.6	miles	mi
AREA	cm^2	square centimeters	0.16	square inches	in^2
	m^2	square meters	1.2	square yards	yd^2
	km^2	square kilometers	0.4	square miles	mi^2
	ha	hectares (10,000 m^2)	2.5	acres	
MASS (Weight)	g	grams	0.035	ounces	oz
	kg	kilograms	2.2	pounds	lb
	t	tonnes (1000 kg)	1.1	short tons	
VOLUME	ml	milliliters	0.03	fluid ounces	fl oz
	l	liters	2.1	pints	pt
	l	liters	1.06	quarts	qt
	l	liters	0.26	gallons	gal
	m^3	cubic meters	35	cubic feet	ft^3
	m^3	cubic meters	1.3	cubic yards	yd^3
TEMP. $F = \frac{9}{5}C + 32$	°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

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TESTS

1. How many meters in a kilometer ?

2. How many cm in a m?

3. How many mm in a m?

4. How many mm in a centimeter?

5. How many inches in a foot?

6. How many inches in a yard?

7. How many cm in 1 inch?

8. About how many inches in 1 meter

9. About how many inches in 1 cm?

10. Which measuring system is used in Japanese cars?

11. How many liters in 1 gallon?

TECHNICAL GLOSSARY

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 12

common
firsts and seconds
kiln dried
sap
surfaced (dressed)
planing machine
S4S (surfaced four sides)
D4S (dressed four sides)
RGH (rough)
mm (milimeters)
plywood
plies
right angles
waterproof glue
face and back plies
veneers
N (natural finishes)
veneer core
lumber-core
particle board
chip-core
wood chips
shavings
"flake board"
plastic laminates
counter tops
bathroom vanities
kitchen cabinets
hardboard
tempered
pegboard (perforated)
filigree patterns

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 12

hardwood
softwood
conifers
evergreen trees
broad-leafed
deciduous trees
spruce
basswood
fir trees
pine
white ash
black cherry
lauan (Philippine Mahogany)
sugar maple
white oak
red oak
white fir
Douglas fir
Ponderosa pine
white pine
red cedar
redwood
Sitka spruce
grade
knots
skids
pallets
checks
pitch pockets
wane
warp
select

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY
Chapter 12

textured
embosed wood grains
metallic speckles
mitered
chair rail
corner guard
round
quarter-round
cove
window stool

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

Chapter 12

defects

classifications

category

adjoining

CEMENT AND TILE WORK

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 13 - Cement & Tile Work

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Barnett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 13 , pages 211 - 222

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. List the steps involved in replacing a ceramic tile 2. State the steps one follows when regrouting a ceramic tile wall 3. Repeat the procedure for regrouting around a bathtub or shower 4. Demonstrate knowledge of how to mix concrete for repairing cracks and holes in concrete 5. Recite the procedures for patching stucco	see Glossary	see Glossary	1. There are always some cracks or holes around a school that needs to be repaired 2. An attempt should be made to get a cement or tile contractor to let the students watch him at work or have him come in to give a talk and do a demonstration

Length of Lesson	Evaluation	Materials and Notes
2 weeks	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

TECHNICAL GLOSSARY

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 13

ceramic tiles
grout
pointed can opener
level
notched trowel
spacers
ceramic tile cutter
score
tile nipper
ready-mixed
rubber-covered grout float
regrouted
cures
nozzle
epoxy cement
hardener
emulsion
portland cement
sand
shovel
pail
hoe
mixing tub
wheel-barrow
trowel
tamp
whisk broom
bonding agent
splash blocks
runoffs
polyvinyl acetate
silicone resin
stucco
lime
wire lath
concrete block

RELATED GENERAL GLOSSARY

match
batch
exactly
contrasting
irregular shapes
film
periodically
disposable
absorbing
overnight
mentioned
previous
shifts
rigid
dust
crevice
tubes
platform
streaks
ingredients
reform
fairly stiff
shrink
alternative
burlap sacking
thoroughly
commercially
textured surface
interlace
scratch
one-quarter
remedied

BASIC ELECTRICAL REPAIRS

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 14 - Basic Electrical Repairs

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Barrett & McKnight, Glencoe Publ. Co., Encino, CA., 1985

Chapter 14 , pages 223 - 250

Lab Manual pages

Additional instructor Materials

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. Identify the parts through which electricity comes into a home or apartment 2. Names devices such as circuit breakers and fuses and different types of wire and conduit used 3. List safety rules one should always follow when working with electricity 4. Recite the steps in replacing a fuse and finding the short 5. Replace an outlet and a switch using the proper procedure 6. Replace a light fixture 7. Repair a doorbell circuit 8. Replace a plug 9. Wire a single pole switch with receptacle and wire a 3-way switch	see Glossary	see Glossary	1. Leave plenty of extra time for the students to wire circuits on their own. Some students will have no problem with the three-way switch or the split-wired receptacles 2. A big emphasis needs to be placed on safety

Length of Lesson

2-3 weeks

Evaluation

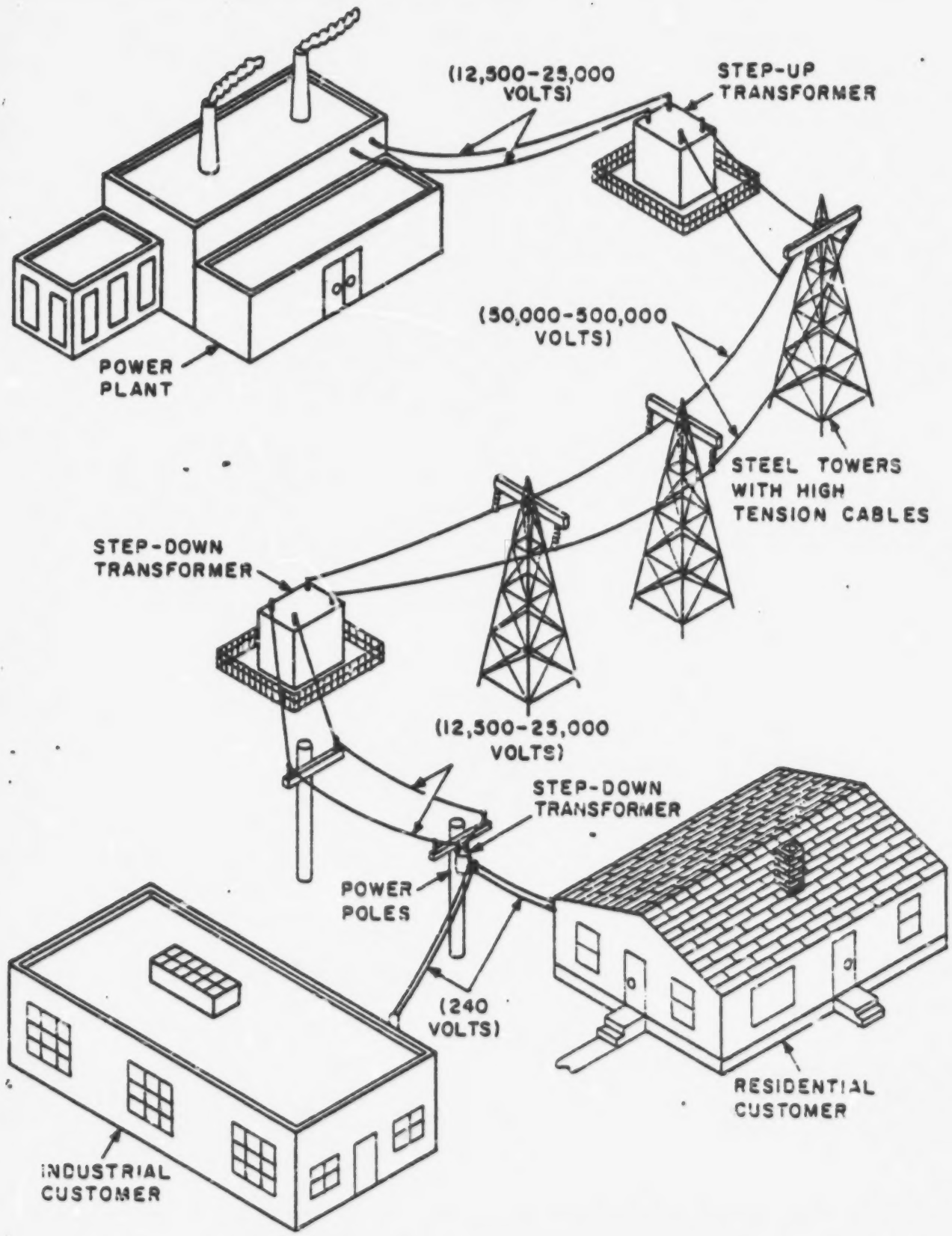
The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures

Materials and Notes

Electrical Housewiring Explained,
Filmstrip #803
Dist.. by:

Bergwall
P.O. Box 238
Garden City, NY 11530
1-800-645-3565

TEACHING MATERIALS



Simplified method of transmitting commercial power long distance.

199

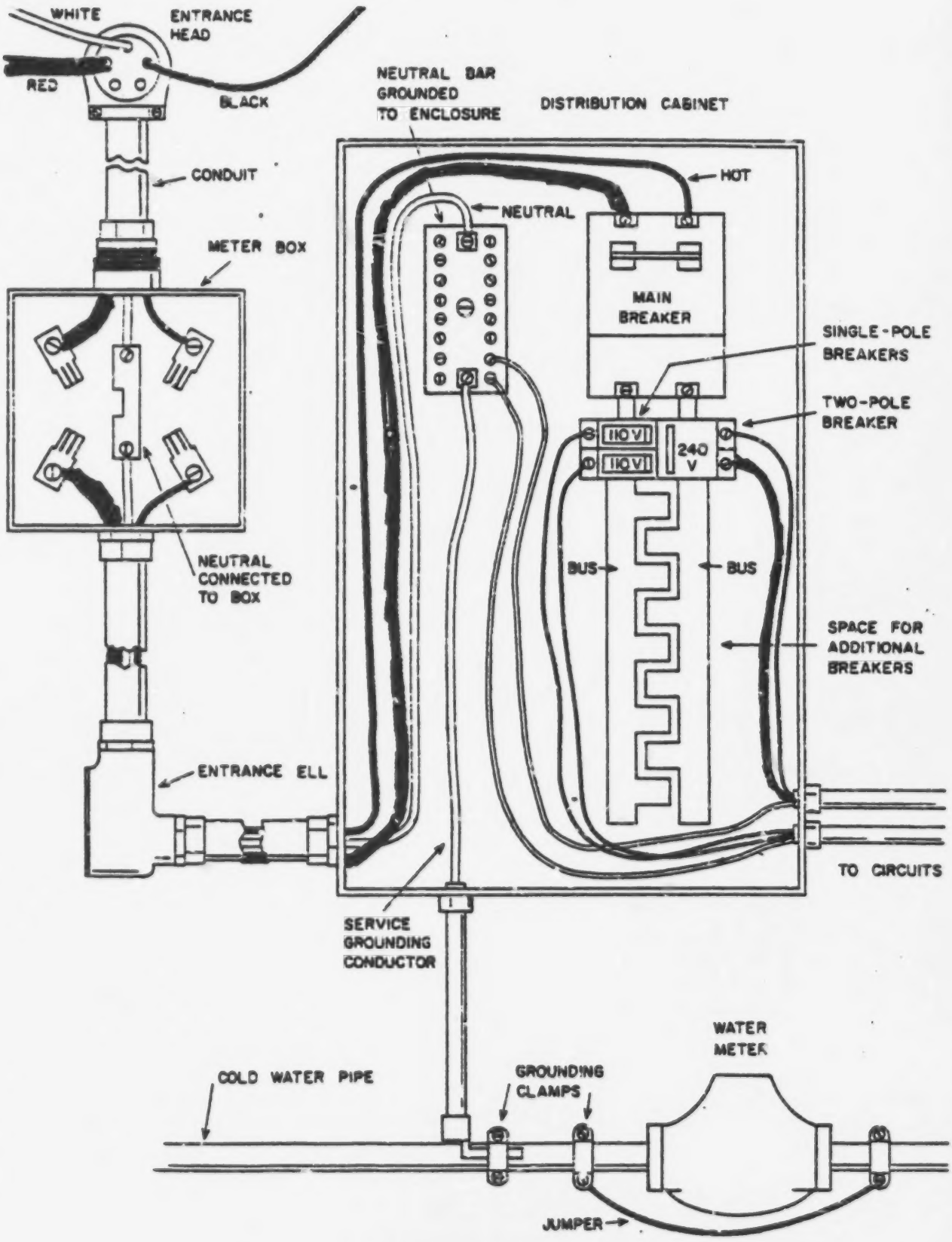


Figure 2-18. View of Service

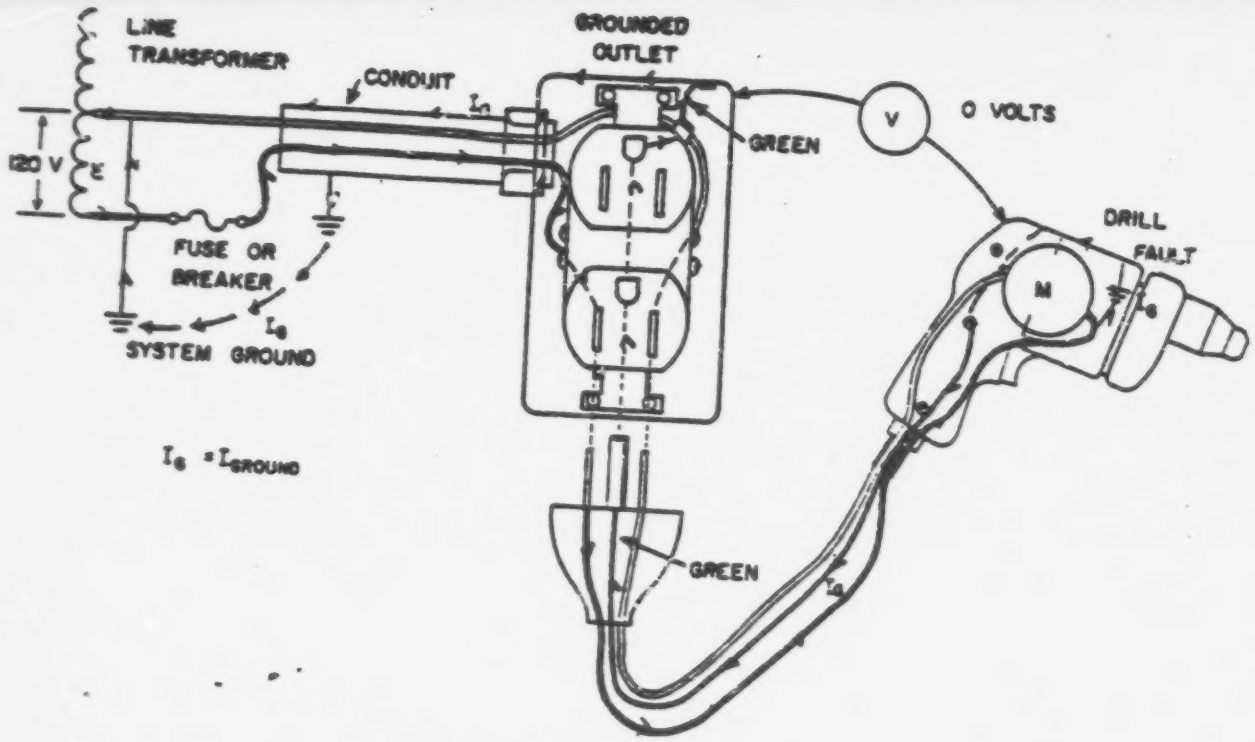


Figure 2-13A, Circuit Showing Ground Fault

Figure 2-13A shows the short circuit path through the circuit breaker when the appliance frame is connected to the system ground. The circuit breaker opens the circuit in this case. Figure 2-13B shows the same fault with the frame of the appliance not grounded. In this case the appliance frame would have a voltage of 120 volts above ground. In this situation current would flow through the body of anyone touching the appliance and touching the conduit, water pipe, gas pipe or damp concrete.

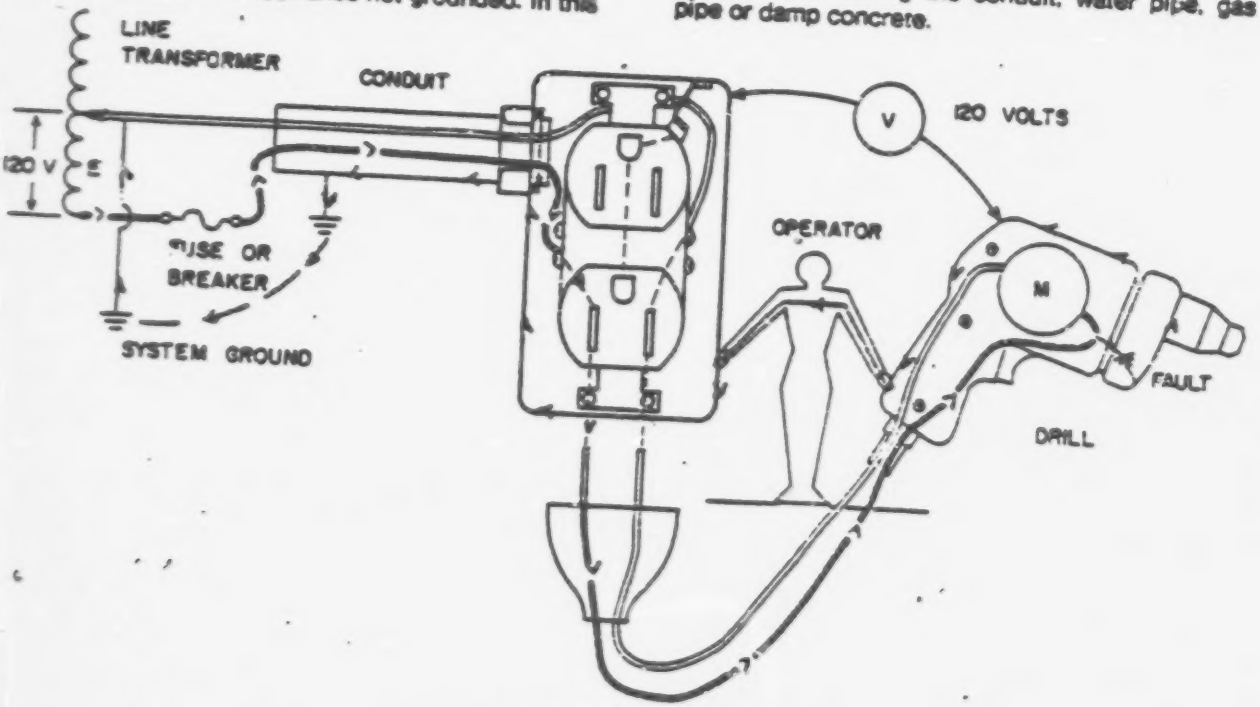
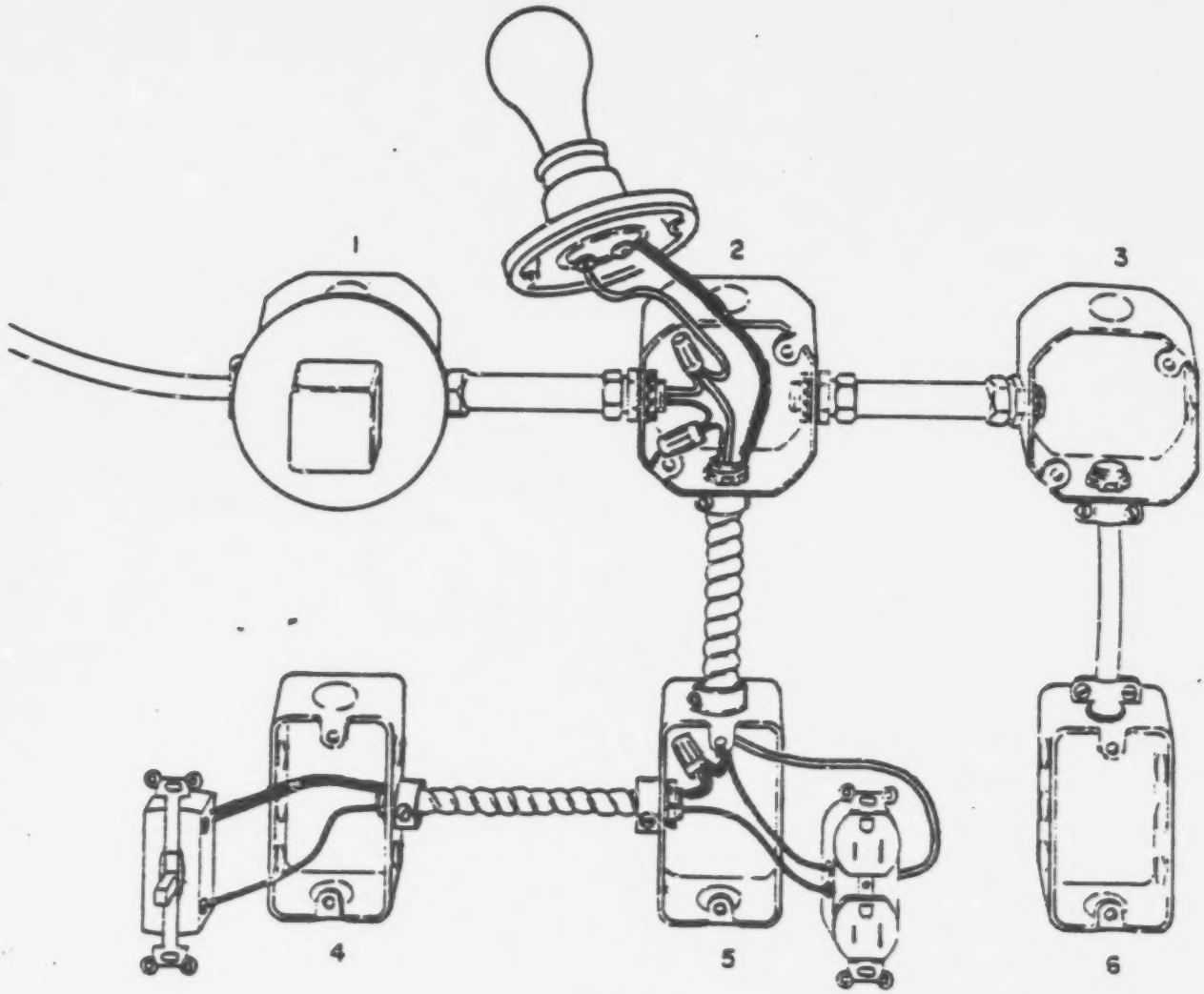


Figure 2-13B, Circuit Showing Improper Grounding



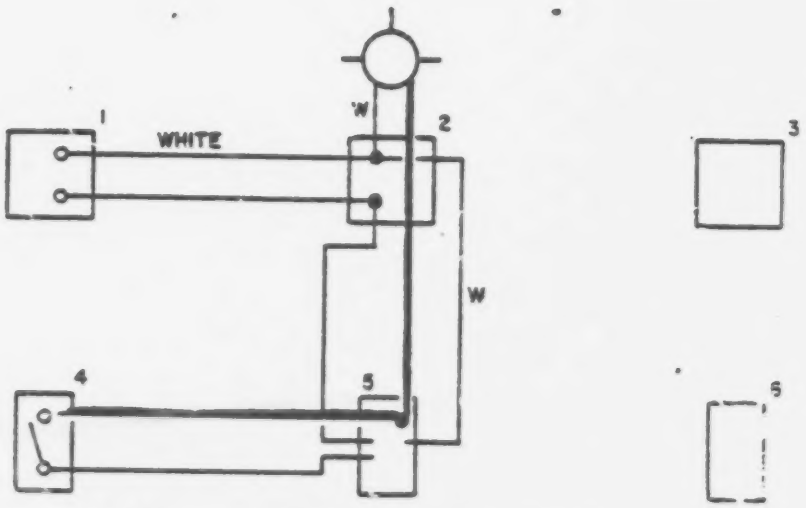
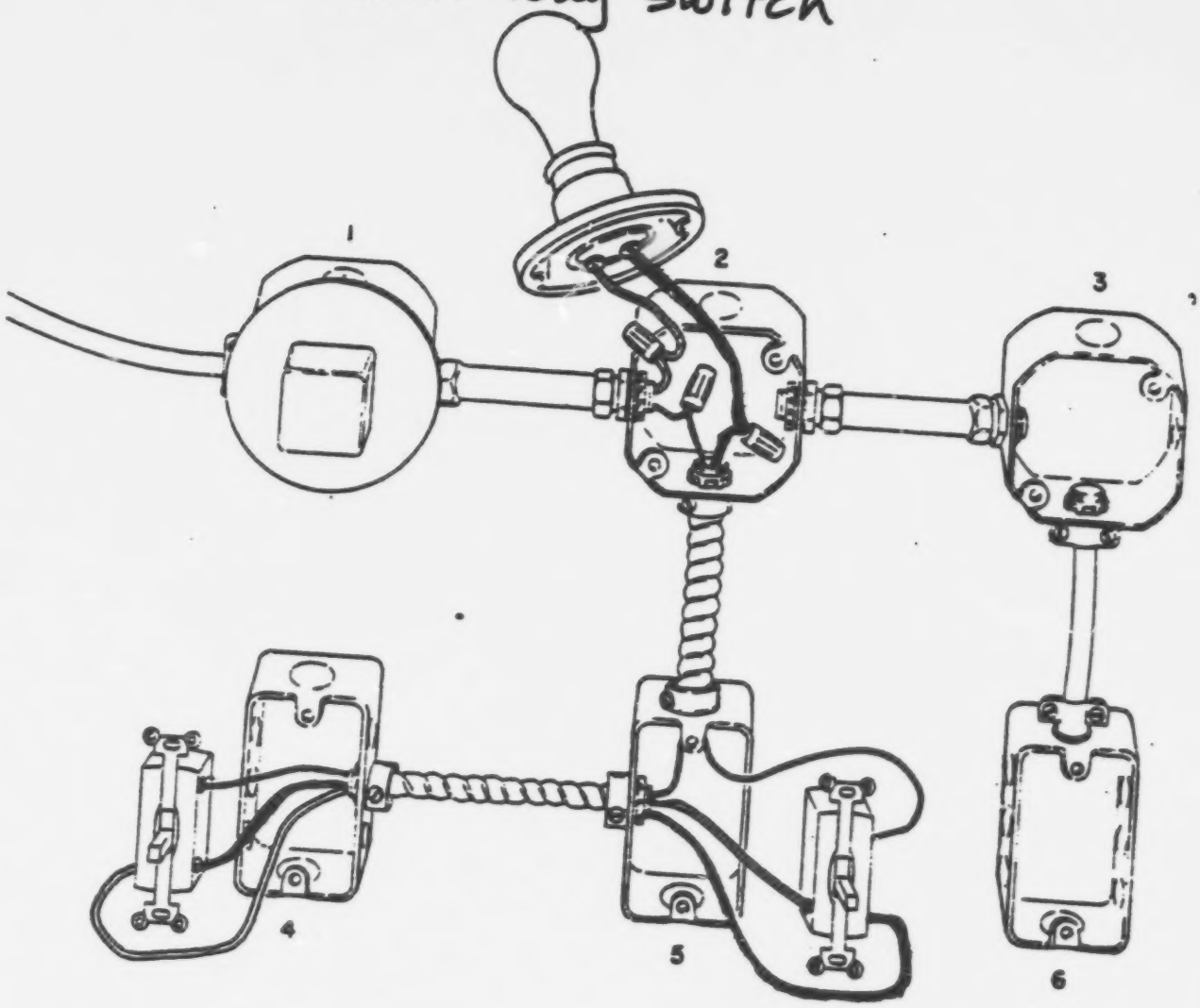


FIGURE 7-1. Diagram of Switch-Controlled Lampholders

Three-way switch



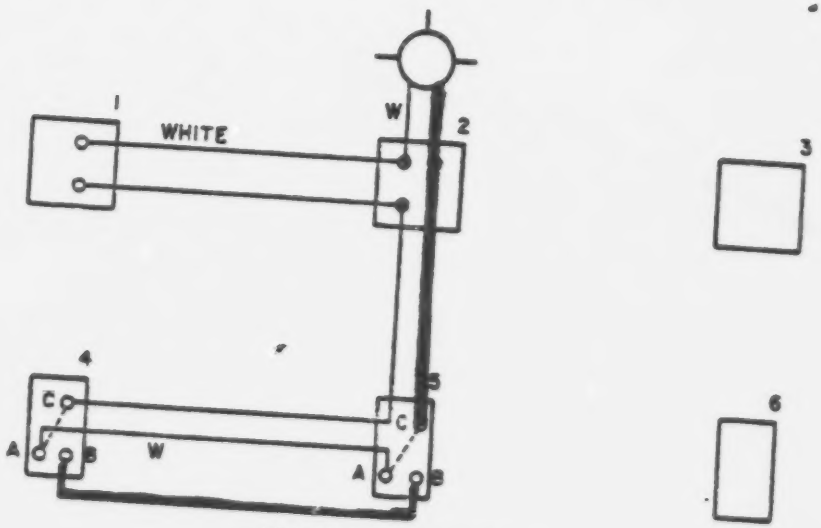


FIGURE 8-3. Experimental Circuit

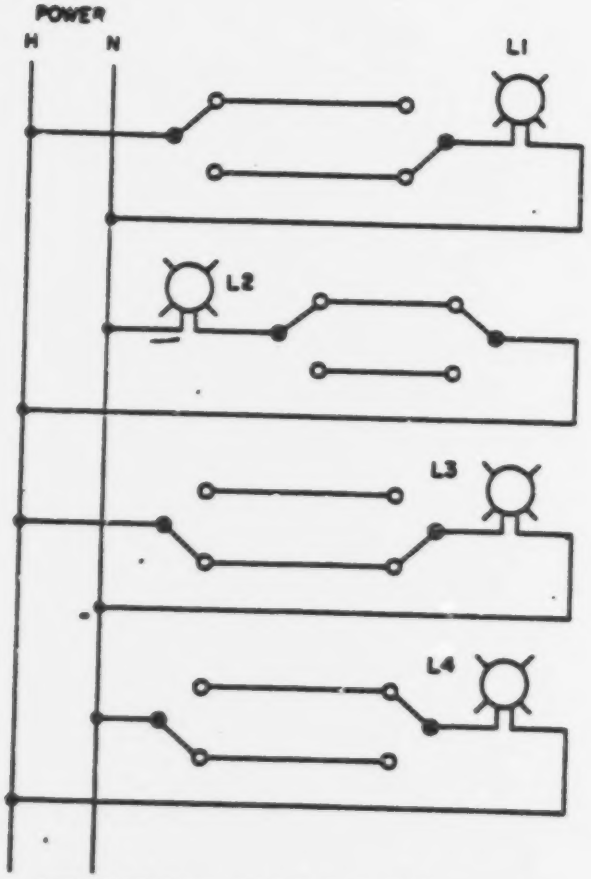


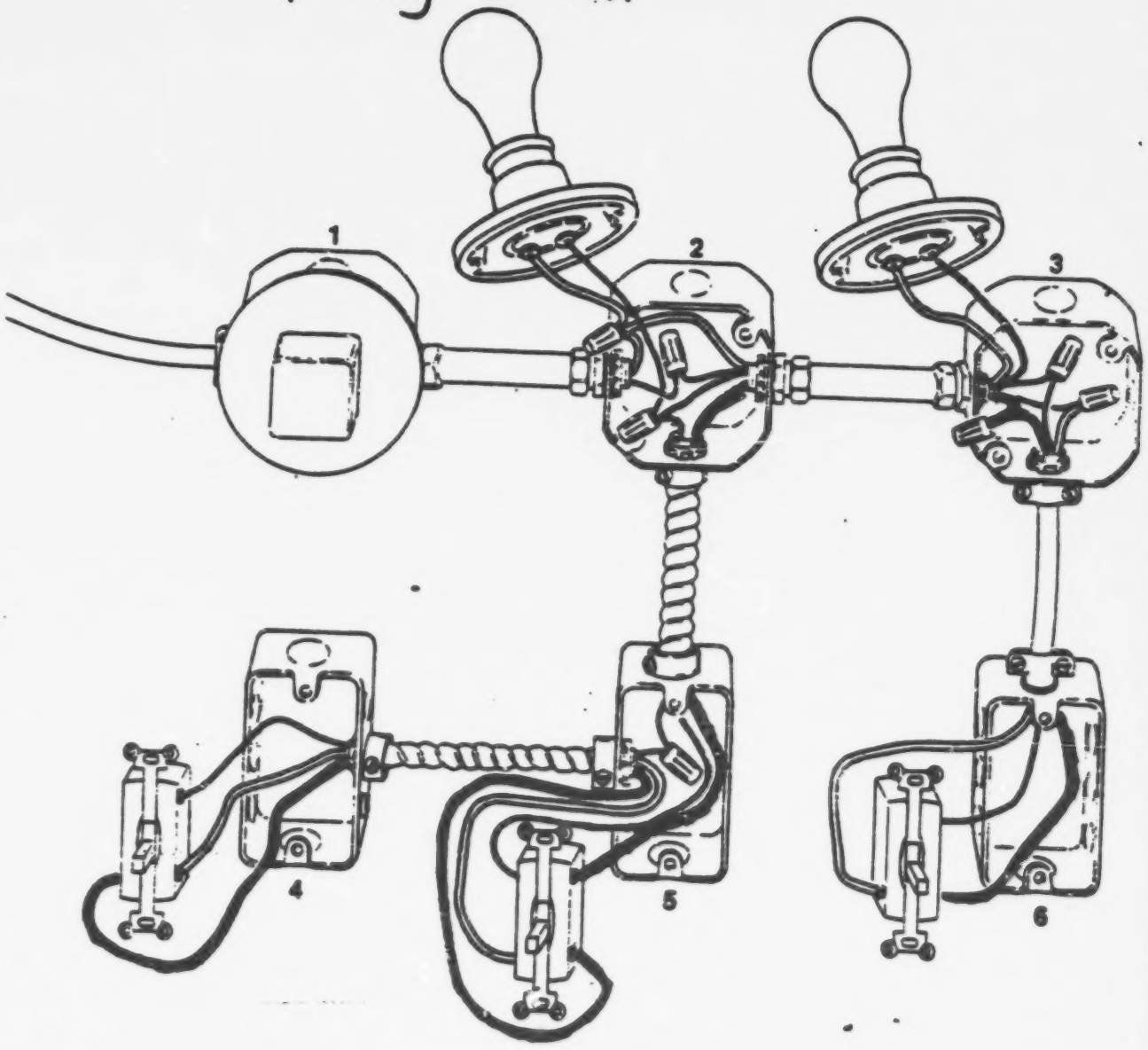
FIGURE 8-5. Diagram of Various 3-Way Switch Hookups

SUMMARY

The 3-way switch is a single-pole, double-throw switch. A 3-way switch has one input called the common or hinge point, and two output terminals called travelers. The common, or hinge point, can be identified on different types of 3-way switches by its color. Three-way switches are always used in pairs to control a fixture from two different locations.
Always check your wiring before applying power.

STUDENT CONCLUSIONS

4-Way switch



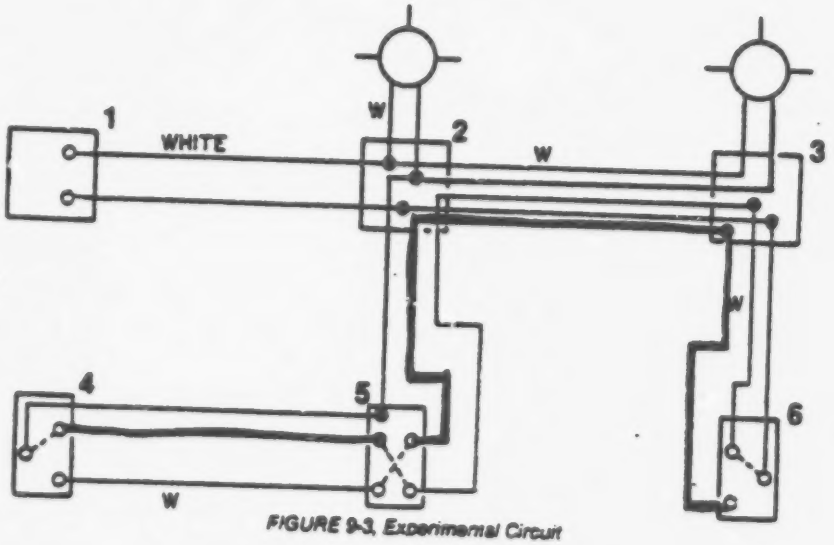


FIGURE 9-3. Experimental Circuit

Split-Wired Receptacles

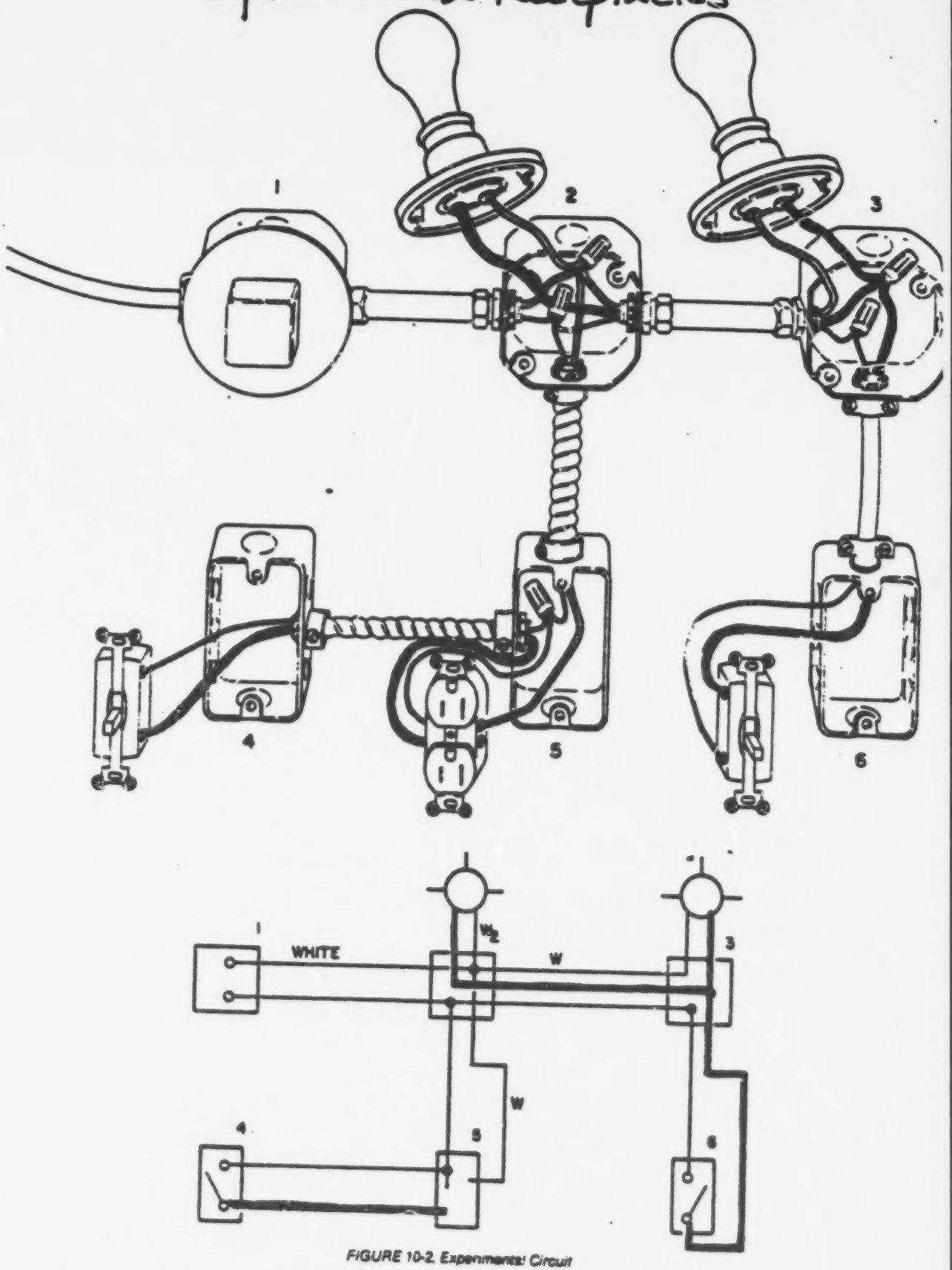


FIGURE 10-2. Experimental Circuit

ELECTRICITY

Electric Current: $I = \frac{q}{t}$

I = current q = quantity of charge t = time

Coulomb's Law of Electrostatics: $F = k\frac{q_1 \cdot q_2}{d^2}$

F = force between two charges
k = proportionality constant
$q_1 \cdot q_2$ = product of charges
d = distance separating charges

Capacitance of a Capacitor: $C = \frac{q}{V}$

C = capacitance of a capacitor
V = potential difference between plates
q = charge on either plate

Ohm's Law of Resistance: $E = I \cdot R$

E = emf of source I = current in the circuit
R = resistance of the circuit

Joule's Law: $H = I^2 \cdot R \cdot t$

H = heat energy I = current R = resistance t = time

Faraday's Law of Electrolysis: $m = z \cdot I \cdot t$

m = mass z = electrochemical equivalent
I = current t = time

Induced emf: Coil in a Magnetic Field: $E = -N\frac{\Delta\Phi}{\Delta t}$

E = induced emf N = number of turns
$\Delta\Phi/\Delta t$ = the change in flux linkage in a given interval of time

Induced emf: Conductor in a Magnetic Field: $E = B \cdot l \cdot v$

E = induced emf B = flux density of the magnetic field
l = length of conductor
v = velocity of conductor across magnetic field

Instantaneous Voltage: $e = E_{max} \sin \theta$

e = instantaneous voltage
E_{max} = maximum voltage
θ = angle between the plane of the conducting loop and the perpendicular to the magnetic flux (displacement angle)

Instantaneous Current: $i = I_{max} \sin \theta$

i = instantaneous current
I_{max} = maximum current
θ = displacement angle

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TESTS

Filmstrips

ABOUT THE AUTHOR

Richard Hunter is the chairman of the district-wide Vocational-Technical Education program at the Bellmore-Merrick Central High School District, New York. He has taught industrial electronics and electrical courses both at the high school and college levels and has conducted advanced electrical and electronics workshops for industrial teachers.

Mr. Hunter has a B.S. and M.S. degree in industrial education and curriculum development. As a committee chairman, he has developed state-wide comprehensive regents examinations and has written electrical and electronics curriculum syllabi for the State of New York in addition to lab manuals, instructional manuals, and an audiovisual program. He has many years of practical experience as a licensed master electrician and a registered builder in the State of New York. As an educational consultant, he has developed and organized special training programs for technicians and engineers for the Grumman Aircraft Engineering Corporation.

Mr. Hunter recently authored a series of color/sound filmstrips entitled, "BASIC ELECTRICITY AND ELECTRONICS EXPLAINED - DIRECT CURRENT." It has gained wide acceptance and has been endorsed by educators in every state. With this background, we are pleased to produce this second series written by Richard Hunter. We are sure you will be pleased too!

* SEE LESSON PLAN FOR FURTHER INFORMATION.

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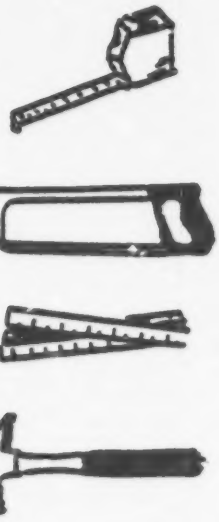
REVIEW QUESTIONS FOR
[illegible]

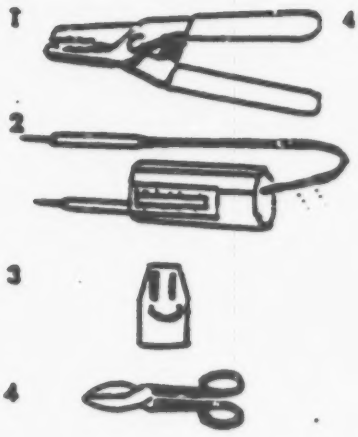
NATIONAL ELECTRICAL CODE AND REQUIREMENTS

I. Directions: Match the following:

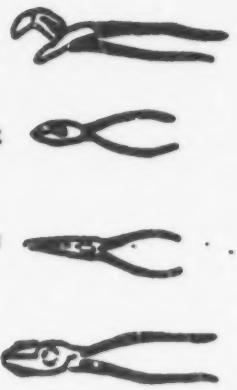
1. 4 a. clawhammer
   2 b. hacksaw
   3 c. folding rule



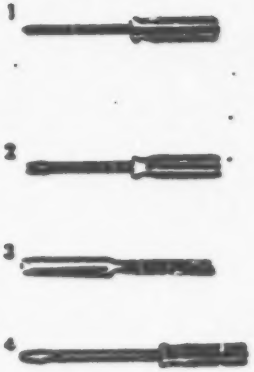
2. 2 a. voltage tester
   1 b. wire strippers
   3 c. hammer loop



3. 2 a. diagonal cutter
   3 b. longnose cutter
   4 c. lineman's pliers



4. 2 a. 4 inch screwdriver
   1 b. Phillip's head screwdriver
   4 c. 8 inch screwdriver



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II. Directions: Select one of the three choices that best completes the statement or answers the question. Place an "X" in the space provided.

5. An electrician can find out how a house is constructed and what materials will be used from:

___a. a picture of the house

X b. a set of architect's blueprints

___c. the National Electrical Code

6. The National Electrical Code is the standard for the electrical industry. It is used by electricians to determine:

___a. how to design electrical systems

___b. how to wire up a circuit

X c. the minimum safety standards for installing and maintaining electrical wiring and equipment

7. To do electrical work safely, an electrical worker should always wear:

___a. gloves and apron

X b. safety helmet and safety glasses

___c. high shoes

8. Which architectural electrical symbol is the correct symbol for a lighting outlet?

___a.

X b.

___c.

9. Which architectural electrical symbol is the correct symbol for a duplex receptacle outlet?

X a.

___b.

___c.

10. Which architectural electrical symbol is the correct symbol for a single pole, flush toggle switch?

___a.

X b. S

___c. S_3

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11. On the electrical floor plan, curved dash lines are drawn between outlets and switches to:

X a. indicate which switch or switches control the outlet

___b. show which way to run the wires

___c. indicate the edge lines

12. All electrical wire is graded for size according to:

___a. ampacity

X b. American Wire Gauge Standard

___c. length and diameter

13. The current carrying capacity of a wire is called:

X a. ampacity

___b. capacity

___c. ampere

14. The larger the diameter of a wire:

X a. the greater the current carrying capacity

___b. reduces the current carrying capacity

___c. has no effect on the current carrying capacity

15. Two-wire non-metallic sheathed cable contains the following conductors:

___a. Black & White conductors only

X b. Black, White & bare grounding conductors

___c. Black, White and Red conductors

16. Which wire in a cable is the identified conductor and is considered the grounded neutral:

X a. White wire

___b. Black wire

___c. uninsulated wire

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17. Which type of non-metallic sheathed cable can be used for both exposed and concealed work in normally dry locations only?

X a. type NM

___b. type NMC

___c. type BX

18. An internal copper or aluminum bonding strip is placed inside armored cable to:

___a. provide an extra conductor

X b. insure for a good electrical grounding

___c. help strip the cable

20. Armored cable containing two number 12 wires is written:

___a. $\frac{12}{2}$

X b. 12-2

___c. 2 #12

19. The color code for four conductor armored cable is:

___a. Black, Red, White, uninsulated

X b. Black, Red, Blue, White

___c. Black, Red, Green, White

Answers to Review Questions for
FILMSTRIP #1 --
NATIONAL ELECTRICAL CODE AND REQUIREMENTS

1.a.	4	refer to frame	14	5.	b	refer to frames	4-6
b.	2	refer to frame	14	6.	c	refer to frame	12
c.	3	refer to frame	15	7.	b	refer to frame	13
				8.	b	refer to frame	27
2.a.	2	refer to frame	19	9.	a	refer to frame	30
b.	1	refer to frame	18	10.	b	refer to frame	32
c.	3	refer to frame	20	11.	a	refer to frame	34
				12.	b	refer to frame	36
3.a.	2	refer to frame	17	13.	a	refer to frames	40,41
b.	3	refer to frame	17	14.	a	refer to frame	41
c.	4	refer to frame	17	15.	b	refer to frame	46
				16.	a	refer to frame	47
4.a.	2	refer to frame	15	17.	a	refer to frame	49
b.	1	refer to frame	16	18.	b	refer to frame	54
c.	4	refer to frame	14	19.	b	refer to frame	57
				20.	b	refer to frame	60

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REVIEW QUESTIONS FOR FILMSTRIP #2

ELECTRICAL WIRING TECHNIQUES

Directions: Select one of the three choices that best completes the statement or answers the question. Place an "X" in the space provided.

1. Which type of diagram uses the symbols as shown on the architect's plans and uses curved lines to show how the cables will be run?

   ✓ a. cable layout

   ___ b. schematic

   ___ c. wiring

2. Which type of diagram is an organized drawing of a circuit using standard symbols to represent the various components?

   ___ a. cable layout

   ✓ b. schematic

   ___ c. wiring

3. Which type of diagram uses rectangles or circles to represent components showing their actual position and layout?

   ___ a. cable layout

   ___ b. schematic

   ✓ c. wiring

Diagram A

4. Refer to diagram A. The dash lines drawn at a slight angle to the perpendicular of the cable line represent:

   ___ a. the type of cable it is

   ✓ b. the number of wires in the cable

   ___ c. which way the cable is to be run

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5. Refer to diagram A. The cable with the arrow and a number indicates:

___a. the number of wires and the direction of the cable

___b. the type of cable and where it is going

✓c. the cable going to the main panel box and the number of the branch circuit fuse or circuit breaker

Diagram B

6. Refer to diagram B. In circuit wiring diagrams this symbol represents a:

✓a. duplex receptacle

___b. lighting fixture

___c. two-way switch

7. Refer to diagram B. The box with dash lines around the symbol represents:

___a. the shape of the room

✓b. the electrical outlet box

___c. the main power panel

8.

This drawing represents a:

___a. lighting outlet box

___b. sectional switch box

✓c. sectional switch box with side mounting brackets

9. For the purpose of long established custom, uniform installation and safety, the location of standard convenience receptacle outlets is:

___a. anyplace on a wall

✓b. 12 inches above the floor

___c. 6 inches above the floor

10. The National Electrical Code requires that the front edge of all electrical outlet boxes:

___a. be painted red

___b. be flush with the edge of the stud

✓c. be flush with the finished surface of walls and ceilings

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11. When drilling holes in wood building members, electrical code requires that the hole be bored at least two inches in from the nearest edge or:

___a. 12 inches from the floor

✓ b. in the center of 2x4 studs

___c. no larger than ¼ inch

12. This drill is known as an:

___a. auger

___b. auger drill

✓ c. auger bit and brace

13. To make it easier to pull the cable through a bored hole without damaging the cable, the auger bit should be:

___a. the same size as the cable

✓ b. 1/8 inch larger than the size of the cable

___c. one inch in diameter

14. Holes are bored in a stud at a slight angle to:

✓ a. provide clearance for the operation of the brace

___b. make it easier to pull the cable

___c. hold the cable securely

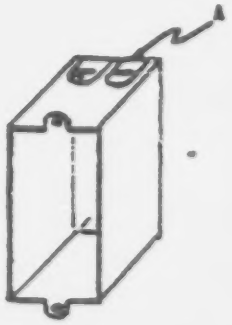
15. The length of stripped cable that should be provided at each outlet box is at least:

___a. 4 inches

___b. 6 inches

✓ c. 8 inches

16. Part A of this drawing is known as a:



___a. cable clamp

___b. vent hole

✓ c. knockout plug

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17. Non-metallic cable is secured to the outlet box by:

___a. staples

___b. the knockout

✓c. a cable clamp

18. The Electrical Code requires that a cable be strapped or stapled when entering a box or fitting not more than:

___a. four feet from the box

✓b. 12 inches from the box

___c. 8 inches from the box

20. To make sure that the electrical wiring is installed in accordance with the National Electrical Code, a thorough inspection is made by:

___a. the homeowner

___b. the builder

✓c. an electrical inspector

19. In making bends in a cable, the cable must not be bent to a radius less than:

___a. 5 inches

___b. the cable diameter

✓c. 5 times the cable diameter

Answers to Review Questions for
FILMSTRIP #2
ELECTRICAL WIRING TECHNIQUES

1.	a	refer to frame	7	11.	b	refer to frame	35
2.	b	refer to frame	10	12.	c	refer to frames	36,37
3.	c	refer to frame	11	13.	b	refer to frame	38
4.	b	refer to frame	8	14.	a	refer to frame	40
5.	c	refer to frame	9	15.	c	refer to frames	50,55
6.	a	refer to frame	16	16.	c	refer to frames	61,62
7.	b	refer to frame	16	17.	c	refer to frames	63-65
8.	c	refer to frames	18,19	18.	b	refer to frame	66
9.	b	refer to frame	21	19.	c	refer to frames	71,72
10.	c	refer to frames	24-26	20.	c	refer to frames	74-76

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REVIEW QUESTIONS FOR FILMSTRIP #3

RECEPTACLES & GROUND FAULT CIRCUIT INTERRUPTERS

Directions: Select one of the three choices that best completes the statement or answers the question. Place an "X" in the space provided.

1. This is a drawing of a:

___a. single receptacle

✓ b. duplex receptacle

___c. G.F.I. receptacle

2. On a 15 ampere, 125 volt receptacle the long opening is the:

___a. grounding contact

___b. hot contact

✓ c. grounded or neutral contact

3. The round or U shaped opening on a receptacle is the:

✓ a. grounding contact

___b. hot contact

___c. grounded or neutral contact

4. The National Electrical Code requires that the wiring terminals of receptacles be identified. The grounded or neutral terminal is:

✓ a. silver or nickel-plated screw

___b. brass or bronze screw

___c. green hex-headed screw

5. The grounding terminal on a receptacle is a:

___a. silver or nickel-plated screw

___b. brass or bronze screw

✓ c. green hex-headed screw

6. The tool that can be used to strip insulation from wires and to form terminal loops is:

___a. a knife

___b. long nose pliers

✓ c. wire stripper

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7. The identified grounded circuit conductor, also called the neutral conductor, is color coded:

✓ a. white

___ b. black

___ c. bare copper

8. The ungrounded conductor of a circuit, also known as the unidentified conductor or Hot conductor, is color coded:

___ a. white

✓ b. black

___ c. bare copper

9. The grounding conductor that is used to ground equipment or the wiring system is color coded:

___ a. white

___ b. black

✓ c. bare copper

10. The grounding conductor must be connected to the outlet box to effectively ground the metal box. This is done by:

___ a. soldering the wire

✓ b. attaching grounding clips

___ c. folding wire under knock-out

11. Grounding receptacles can be grounded to the outlet box by:

___ a. connecting the white wire to the box

✓ b. connecting green bonding jumper between box and receptacle

___ c. connecting the bare wire to the box

12. More than one wire may be connected to a receptacle provided:

___ a. the wires are twisted together

___ b. the terminal loops are closed

✓ c. only one wire is placed under each screw terminal

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13. When a receptacle is being pressed into position in an outlet box the wires are formed into:

___a. a circle

✓ b. an S shape

___c. a bell

14. To cover any opening in a wall and to give a receptacle a finished appearance, the last part that is installed is called a:

✓ a. face plate

___b. receptacle cover

___c. grounding clip

15. To protect against the possibility of electrical shocks the National Electrical Code requires ground fault circuit protections on receptacle outlets installed:

___a. in kitchens and bathrooms

___b. outdoors and in garages

✓ c. outdoors and in bathrooms

16. All ground fault interrupter receptacles are designed to detect:

✓ a. an imbalance of current caused by a ground fault

___b. an overload on the receptacle

___c. a ground fault or an overload

17. A ground fault interruptar receptacle will shut off the power to the output if there is an unbalance of:

___a. 5 ampere

___b. 30 milliampere

✓ c. 5 milliampere

18. When installing the G.F.I. receptacle in an outlet box, it must be mounted:

___a. horizontal

___b. vertical

✓ c. upright with the printing readable

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19. The G.F.I. receptacle can be turned on by pressing the:

___a. test button

✓ b. reset button

___c. circuit breaker

20. The G.F.I. receptacle should be tested by the homeowner:

___a. once a year

___b. every six months

✓ c. every month

Answers to Review Questions for
FILMSTRIP #3
RECEPTACLES & GROUND FAULT CIRCUIT INTERRUPTERS

1.	b	refer to frames	5,6	11.	b	refer to frame	35
2.	c	refer to frame	7	12.	c	refer to frame	42
3.	a	refer to frame	9	13.	b	refer to frames	43,44
4.	a	refer to frame	10	14.	a	refer to frames	46,47
5.	c	refer to frame	12	15.	c	refer to frame	52
6.	c	refer to frames	17-25	16.	a	refer to frame	57
7.	a	refer to frame	26	17.	c	refer to frames	58-60
8.	b	refer to frame	27	18.	c	refer to frame	73
9.	c	refer to frame	28	19.	b	refer to frames	75,79
10.	b	refer to frames	29-33	20.	c	refer to frame	80

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REVIEW QUESTIONS FOR
[illegible] #4

SWITCH CONTROL

Directions: Select one of the three choices that best completes the statement or answers the question. Place an "X" in the space provided.

1. The most frequently used switch for lighting circuits is the:

___a. pull chain switch

___b. rotary switch

X c. flush toggle switch

2. When lights or other loads must be controlled from one switching point, the switch used is a:

X a. single pole switch

___b. double pole switch

___c. three-way switch

3. Toggle switches used for AC lighting circuits are classified as AC General Use Snap Switches. The snap switch is always marked with the:

___a. voltage rating

___b. current rating

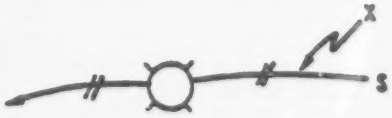
X c. voltage and current rating

4. The single pole snap switch is always connected in series with the load using the:

X a. hot wire

___b. ground wire

___c. grounding wire

5. 

The cable between the light and the switch ("X") is known as a:

___a. traveler

X b. switch loop

___c. feed cable

6.

This box is a:

___a. switch box with mounting strap

___b. switch box with extension

X c. octagon box with bar holder

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7. The height of the switch box is measured from the center of the switch to the finished floor. This should be between:

___a. 12 to 14 inches

___b. 3½ to 4 feet

X c. 48 to 50 inches

8. If the location of a ceiling outlet is not shown on the building plans it should be mounted:

___a. wherever you choose

X b. in the center of the room

___c. after the owner moves in

9. When drilling holes in ceiling joists and the top plate of a wall, using a brace with an extra long auger bit provides:

X a. better leverage and holes with less slant

___b. larger holes

___c. no advantage

10. In electrical work there are three sizes of hacksaw blades used. They are:

___a. 10 inch, 12 inch, 14 inch

X b. 32, 24, and 18 teeth per inch

___c. rip, cross cut, and jig

11. When placing the blade in the hacksaw frame the cutting teeth should:

___a. face toward the handle

X b. face forward

___c. face to the side

12. The bare wire provided in armored cable to assure low resistance in grounding is called the:

___a. neutral wire

___b. insulating wire

X c. bonding wire

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13. The part that is inserted between the wires and the cut armor to prevent damage to the wire insulation is called a:

X a. insulating bushing

___b. wire nut

___c. lock nut

14. When fastening armored cable to boxes that have no internal cable clamps, you must use a:

___a. grounding clip

___b. insulating bushing

X c. armored cable connector

15. A lock nut has sharp projections on one side only. This side is threaded onto a connector:

___a. facing away from the box

X b. facing the box

___c. in any direction

16.

This is known as a:

___a. cable connector

___b. lock nut

X c. wire connector

17.

This is known as a:

___a. wire connection

X b. pig-tail splice

___c. fixture splice

18. When cutting wires using the lineman's pliers the cut wire should be pointed:

___a. toward the ceiling

X b. toward the floor

___c. at the wall

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19. The lamp bulb that is installed in a lighting fixture should:

___a. not be more than 60 watts

X b. not exceed the wattage rating of the fixture

___c. be white in color

20. A single pole toggle switch should be mounted in an upright position. When the toggle is in the UP position the switch should be:

X a. ON

___b. OFF

___c. read NO

Answers to Review Questions for
FILMSTRIP #4
SWITCH CONTROL

1.	c	refer to frame	7
2.	a	refer to frame	9
3.	c	refer to frame	10
4.	a	refer to frame	11
5.	b	refer to frames	16,17
6.	c	refer to frames	21,22
7.	c	refer to frame	25
8.	b	refer to frame	27
9.	a	refer to frame	32
10.	b	refer to frame	39
11.	b	refer to frame	40
12.	c	refer to frame	46
13.	a	refer to frames	47,48
14.	c	refer to frames	55,56
15.	b	refer to frames	57,58
16.	c	refer to frames	65-67
17.	b	refer to frames	73,74
18.	b	refer to frame	77
19.	b	refer to frame	81
20.	a	refer to frames	87,88

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REVIEW QUESTIONS FOR
[illegible] #5

THREE-WAY AND FOUR-WAY SWITCHES

Directions: Select one of the three choices that best completes the statement or answers the question. Place an "X" in the space provided.

1. The architectural electrical symbol for a three-way switch is:

___a. $

X b. $_3$

___c. $_4$

2.

This is the schematic symbol for a:

___a. toggle switch

X b. three-way switch

___c. four-way switch

3.

The terminals identified ("X") on this schematic symbol are called:

___a. common terminals

X b. traveler terminals

___c. neutral terminals

4. A three-way switch can be identified by its three screw terminals and the toggle that is:

___a. marked ON and OFF

X b. not marked ON and OFF

___c. marked 3-way

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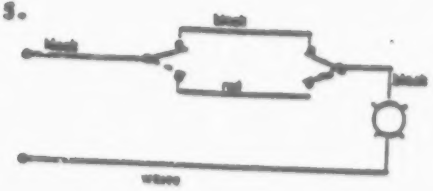
5.



The Black and Red wires connected between the two switches are called:

X a. traveler wires

___b. common wires

___c. switch loop wires

6.

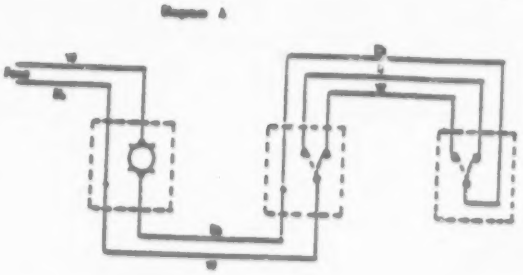
For this cable layout how many wires are required between the two three-way switches?

X a. two

___b. three

___c. four

Questions 7 to 12 refer to diagram A.



7. Diagram A is a:

___a. schematic diagram

X b. wiring diagram

___c. cable layout diagram

8. Article 200-7, exception 2 of the National Electrical Code permits the identified white conductor in a two-wire cable to be used:

X a. as a feed wire to a switch

___b. as the connection from the switch to the load

___c. for grounding the load only

9. The first step in wiring 3-way switch circuits, connect:

___a.
___b.
X c.
___d.

a. traveler wires to the traveler terminals

b. feed wire to common terminal of 3-way switch

c. identified conductor from the source to the load

d. hot terminal of the load to the common terminal of 3-way switch

10. The second step in wiring 3-way switch circuits, connect:

X a.
___b.
___c.
___d.

11. The third step in wiring 3-way switch circuits, connect:

___a.
X b.
___c.
___d.

12. The final step in wiring 3-way switch circuits, connect:

___a.
___b.
___c.
X d.

13.

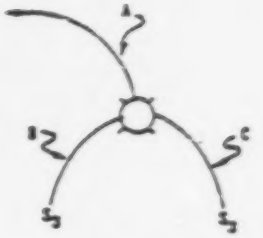


Diagram B

In diagram B, how many wires are required in cable A?

X a. two
___b. three
___c. four

14. In diagram B, how many wires are required in cable C?

___a. two
X b. three
___c. four

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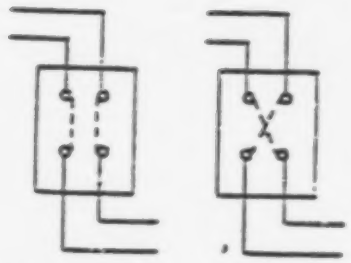
15. The switch that has four terminals and the toggle does not have ON or OFF markings is the:

___a. 3-way switch

X b. 4-way switch

___c. double pole switch

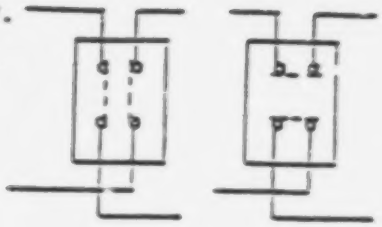
16. 

This is the schematic diagram of a:

___a. crossed type 4-way switch

X b. through type 4-way switch

___c. double pole switch

17. 

This is the schematic diagram of a:

X a. crossed type 4-way switch

___b. through type 4-way switch

___c. double pole switch

18. The architectural symbol for a 4-way switch is:

___a. S_0

___b. S_3

X c. S_4

19. To control a load from three switching points the following switches are needed:

___a. three 3-way switches

X b. two 3-way switches and one 4-way switch

___c. two 4-way switches and one 3-way switch

20. Loads may be controlled from more than three switching points by installing additional:

___a. three-way switches

X b. four-way switches

___c. double pole switches

Answers to Review Questions for
FILMSTRIP #5
THREE-WAY AND FOUR-WAY SWITCHES

1.	b	refer to frame	6
2.	b	refer to frame	7
3.	b	refer to frame	7
4.	b	refer to frame	11
5.	a	refer to frame	15
6.	b	refer to frames	32,33
7.	b	refer to frame	33
8.	a	refer to frames	34,36,37
9.	c	refer to frame	38
10.	a	refer to frame	39
11.	b	refer to frame	40
12.	d	refer to frames	42,43
13.	a	refer to frames	45,46
14.	b	refer to frames	45,46
15.	b	refer to frame	53
16.	b	refer to frame	54
17.	a	refer to frame	55
18.	c	refer to frame	56
19.	b	refer to frame	57
20.	b	refer to frame	65

REVIEW QUESTIONS FOR FILMSTRIP #6

FUSE AND CIRCUIT BREAKER PANELS

Directions: Select one of the three choices that best completes the statement or answers the question. Place an "X" in the space provided.

1. A branch circuit is the circuit conductors between the final overcurrent device protecting the circuit and the outlets. It is known as an Appliance Branch Circuit when it supplies:

   ___a. a number of outlets for lighting and appliances

   X b. a number of outlets for appliances only

   ___c. a single outlet for one large appliance only

2. Schematic diagrams for fuse panels show:

   ___a. the external connection for the fuses only

   X b. the internal connection of the fuse holders to the main bus bars

   ___c. the location of the fuses

3. Standard plug fuses with an Edison base shall be used:

   ___a. for new installations only

   X b. as replacements in existing installations only

   ___c. for any type of installation

4. A branch circuit wired with number 12 wire should be protected with a fuse rated at:

   ___a. 15 ampere (14 wire)

   X b. 20 ampere

   ___c. 30 ampere

5. Type S fuses have different base sizes for identifying the current of the fuse. These fuses may be used:

   ___a. for new installations only

   ___b. as replacements in existing installations only

   X c. for any type of installation

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6. To use an S type fuse in an Edison fuse base panel, you must:

___a. get permission from the inspector

X b. insert a type S adaptor

___c. replace the fuse panel

7. When connecting non-metallic sheathed cable in a fuse panel the grounding wire must be connected:

___a. to a fuse terminal

X b. to the panel grounding terminal

___c. to a mounting screw

8. Outlets protected by branch circuit fuses should be identified on the fuse panel chart:

___a. to make the job look good

X b. to make future identification easy

___c. to pass inspection

9. Circuit breakers are available in standard:

___a. single and double pole

___b. single pole only

X c. single pole, double pole, and twin size

10. Circuit breakers rated at 100 amperes or less shall:

___a. have ampere rating marked on their handle

___b. have the ON and OFF positions marked

X c. have both ampere rating and the ON and OFF positions marked

11. When connecting armored cable to a circuit breaker panel, the armor:

___a. serves as the neutral conductor

X b. is grounded through the panel to the grounding terminal strip

___c. serves no purpose

12. To place a circuit breaker into a panel,:

___a. just push it in firmly

___b. push jaws on bus bar tab and then over protruding metal stud

X c. engage breaker slot over protruding metal stud first, then push jaws firmly onto bus bar tab

13. A circuit breaker with ground fault circuit interrupter provides protection:

___a. from overloads

___b. from ground faults

X c. from both overloads and ground faults

14. A G.F.C.I. circuit breaker has:

X a. a white grounding wire only

___b. load wires and grounding wires

___c. line wires, load wires, and a grounding wire

15. When connecting a G.F.C.I. circuit breaker the white wire of the branch circuit cable is connected to:

___a. grounded terminal strip

X b. breaker terminal marked "Load Neutral"

___c. breaker terminal marked "Load Power"

16. If the G.F.C.I. breaker handle "trips" when placed in the ON position:

___a. the circuit is OK

X b. something is wrong. Turn the handle to OFF position

___c. the breaker is defective

17. With the "Load Power" and "Load Neutral" disconnected, if the breaker handle remains "ON", and trips when TEST BUTTON is depressed:

___a. the breaker is defective

___b. the circuit wiring is faulty

X c. everything is OK

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18. With all wires connected to the G.F.C.I. breaker, push the red test button. If the handle moves to the trip position:

X a. the breaker is operating properly

___b. the breaker is defective

___c. the circuit is faulty

19. The owner should test the operation of a G.F.C.I. breaker:

X a. every month

___b. every six months

___c. once a year

20. Every job done by an electrician should be:

___a. done in a hurry

___b. checked by the owner

X c. neat and clean

Answers to Review Questions for
FILMSTRIP #6
FUSE AND CIRCUIT BREAKER PANELS

1.	b	refer to frames	3-6
2.	b	refer to frame	10
3.	b	refer to frame	11
4.	b	refer to frame	12
5.	c	refer to frame	15
6.	b	refer to frames	16,17
7.	b	refer to frame	26
8.	b	refer to frame	31
9.	c	refer to frame	34
10.	c	refer to frame	36
11.	b	refer to frame	44
12.	c	refer to frames	39,40
13.	c	refer to frame	49
14.	a	refer to frames	52,53
15.	b	refer to frame	54
16.	b	refer to frame	60
17.	b	refer to frame	63
18.	a	refer to frame	66
19.	a	refer to frame	69
20.	c	refer to frame	70

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TECHNICAL GLOSSARY

switches
outlets
electrical cords
plugs
light fixtures
fuses
circuit breakers
branch circuit
overloaded
electricity
wiring system
lineman's pliers
wire stripper
receptacles
appliances
power lines
utility poles
cables
meter socket
electric meter
service panel
conduit
voltage
110-volt
overheated
amperes
current
ceiling or floor beams
wall studding
electrical code
BX cable
armored shield
non-metallic shielded
Romex cable
thin-wall (rigid)

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY
Chapter 14

thick-wall (rigid)
Greenfield (a flexible conduit)
live wire
neutral wire
ground wire
National Electrical Code
bare copper wire
plastic electrical tape
solderless connectors (wire nuts)
terminal screws
thickness (gauge)
electrical load
shock hazard
insulated handles
neon tester
short circuit
blow out
plug fuses
flash
two-wire outlet receptacle
three-wire outlet receptacle
single-pole switches
mercury switches
quiet switches
dimmers
push-button switches
faceplate
mounting screws
brass screw
chrome screw
green screw
crossbar
adapter

low-voltage system
components
push button
chime
bell
transformer
three-way bulbs
key sockets
pull-chain sockets
pushbutton sockets
turn switch
male plug
harp
socket body
shell
setscrew
cardboard insulator
arcs
female plugs
prongs
clampon variety
cardboard disk
Underwriter's knot
strain reliever
coil spring
heavy duty
Underwriters' Laboratories, Inc.
electrical elements
space heaters
rooftop antennas
fire extinguisher
baking soda

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY

Chapter 14

defective
burns out
connections
improvise
inferior
metal strip
troublesome
throwing a switch
automatically
protrudes
canopy
twist
exposed
line up
harm
spark
hook up
strands
compact
shrinks
dim
electric ranges
clothes dryers
pets
"cool lights"

HEATING SYSTEMS MAINTENANCE

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 15 - Heating System Maintenance

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Bennett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 15 , pages 251 - 256

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. Bleed a steam heated radiator heating system 2. Oil and change filters on a forced air heating system 3. Drain a hot water heater	see Glossary	see Glossary	1. Most schools will have a steam heated radiator heating system. Have the maintenance person at the school show the students what he needs to do to maintain the system 2. Hot water heaters at school tend to be very large but will operate and need to be maintained in a similar manner to smaller one. Have the maintenance person demonstrate how he maintains them

Length of Lesson	Evaluation	Materials and Notes
1-2 weeks	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

TECHNICAL GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 15

fuel oil
radiators
registers
steam heated
boiler
forced-air system
grill
"bleeding"
blower motor
fan motor
oil cups
light machine oil
dampers
furnace filter
heating chamber
window air conditioner
central air conditioning systems
hot water heaters
carbon
heating efficiency

RELATED GENERAL GLOSSARY

Chapter 15

hissing

annual

arrow

sludge

garden hose

drain spout

INSULATION

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 16 - Insulation

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Barnett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 16 , pages 257 - 261

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. List the different types of insulation 2. Follow the safety requirements that should be followed when working with insulation 3. Install attic insulation-loose fill, properly 4. Install wall insulation using the proper steps 5. List the various things that should be checked when weatherizing a dwelling	see Glossary	see Glossary	1. Even if the class cannot be involved in insulating a building, you should have no trouble finding a spot which has been insulated previously that the student can look at, such as an attic 2. On your field trip to the lumberyard or building supply store be sure to point out the different types of insulation to the students or better yet have them point them out to you

Length of Lesson	Evaluation	Materials and Notes
1 week	The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures	

TECHNICAL GLOSSARY

thermal insulation
batts
fiberglass insulation
loose fill insulation
glass wool
vermiculite
reflective insulation
rigid insulation
structural
nonstructural
rafters
R value
framing members
studs and joists
foamed in
attic
perlite
rock wool
cellulose
extruded polystyrene board
urethane board
vermin
catwalk
vapor barrier
filter mask
soffits
exhaust fan motors
leveling board
staple gun
flanges
2-mil
polyethylene
storm windows

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 16

double or triple glazing

pointed up

damper

crawl spaces

skirt boards

RELATED GENERAL GLOSSARY

necessity

blocks

passage

mineral or vegetable fibers

rated

resistance reputable

harmbul

breathing passages

stuff

drafts

lighted candle

chinks

ventilation

vent

SETTING UP A WORKSHOP

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 17 - Setting up a Workshop (at home or work)

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Bennett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter 17 , pages 262-275

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. State the essential elements needed in a workshop 2. Draw out a plan of typical workbench to be used in a workshop 3. List the steps involved in installing a vise on a workbench	see Glossary	see Glossary	1. I found that each maintenance person that we met had an entirely different workshop set up than everyone else. This was good for the students to see since everyone has different needs and space limitations

Length of Lesson

1 week

Evaluation

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures

Materials and Notes

320

319

255

255

TECHNICAL GLOSSARY

GLOSSARY

PROPERTY MANAGEMENT AND MAINTENANCE
TECHNICAL VOCABULARY

Chapter 17

do-it-yourselfer

tool boards

power strip

multiple grounded outlets

separate circuit breaker or fuse

laminated

crosspiece

cleats

pegboard

257

RELATED GENERAL GLOSSARY

GLOSSARY
PROPERTY MANAGEMENT AND MAINTENANCE
RELATED GENERAL VOCABULARY
Chapter 17

base of perations

foreseeable

hobby center

mechanical capabilities

elaborate

adequate

attached

shelf

chests of drawers

draw

fumes

handy

orderly

silhouette

labeling tape

slant

JOB SKILLS

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Property Management and Maintenance Curriculum

VOCATIONAL TRAINING LESSON PLAN # 18 - Job Skills

Teaching Materials Source: Home Maintenance Textbook, William Weiss, Barnett & McKnight, Glencoe Publ. Co., Encino, CA., 1983

Chapter _____ , pages _____

Lab Manual pages _____

Additional instructor Materials _____

Main concepts student will learn	Technical Vocabulary	Related Vocabulary	Teaching Activity
The student will be able to: 1. Fill out an application 2. Write a resume 3. Interview for a job 4. Fill out a variety of forms which relate to the property management and maintence field 5. Read, Write, and speak English clearly 6. Work well with others	none	Application form Resume interview salary benefits assistant manager married single dependents contract refundable subletting dialogue mutual premises exclusive waive covenant inventory	1. Set up a mock interview within the class and have a panel of students acting as employers, put the heat on an interviewee. make up a list from questions that the students in the class make up and turn in as a previous class assignment 2. Students should always be reminded that the way they act in class is a reflection of the way they will perform on the job and will affect the recommendation that you, the instructor give 3. Collect a variety of different job applications. Copy them and have each student fill out several different ones they can keep for reference in a file

Length of Lesson

1 week

Evaluation

The student will demonstrate his/her competence in terms of these measurable objectives based upon individual instructors acceptable performance criteria, which may utilize a combination of oral or written testing procedures

Materials and Notes

TEACHING MATERIALS

El Dorado County
Placer County
Sacramento County
Shasta County
Tehama County
Yolo County
Yuba County

SVAA

SERVICE REQUEST

OFFICE COPY

RESIDENT NAME _____

RESIDENT SIGNATURE	ADDRESS OR BLDG. #	APT. #	PHONE #	REQUEST #

DATE AND TIME OF REQUEST ▶ / /	: AM PM	TAKEN BY	ASSIGNED TO	OK TO ENTER IF NO ONE HOME? YES NO	BEST TIME TO FIND RESIDENT AT HOME : AM PM
SPECIAL INSTRUCTIONS					

SERVICE REQUESTED	WORK DONE	MATERIALS USED	COST
			/

TOTAL PARTS $

AMOUNT OF TIME SPENT COMPLETING THIS REQUEST — HOURS | MINUTES — LABOR COST $

SERVICE INCOMPLETE
REASON:

SERVICE COMPLETED — DATE / / — TIME : AM PM

BY _____

CHARGE COST TO RESIDENT YES NO

POSTED:

TOTAL COST $

SVAA

SACRAMENTO VALLEY APARTMENT ASSOCIATION, INC.
serving El Dorado County, Placer County, Sacramento County, Shasta County, Tehama County, Yolo County, Yuba County

SVAA S-14 4/79

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SVAA

RENTAL AGREEMENT
(Month to Month)

THIS AGREEMENT entered into this _____ day of _____, 199___,

by and between _____, "Owner" (Landlord)

and _____, "Resident" (Tenant),

IN CONSIDERATION OF THEIR MUTUAL PROMISES AGREE AS FOLLOWS:

1. Owner rents to the Resident and the Resident rents from the Owner for residential use only, the premises known as:

_____, CA.

2. Rent is due in advance on the _____ day of each and every month, at $_____ per month, beginning on the _____ day of _____, 198___

3. Except as prohibited by law, this agreement may be terminated by either party after service upon the other a written 30-day notice of termination of tenancy. Any holding over thereafter shall result in Resident being liable to Owner for "rental damages" at the fair rental value of $_____ per day.

4. Premises shall be occupied only by the following named persons:

_____ _____

_____ _____

5. Without Owner's prior written permission, no bird or animal, no water beds or liquid filled furniture, or _____ shall be kept or allowed in or about said premises.

6. Resident shall not violate any Governmental law in the use of the premises, commit waste or nuisance, annoy, molest or interfere with any other Resident or neighbor.

7. Except as provided by law, no repairs, decorating or alterations shall be done by Resident, without Owner's prior written consent. Resident shall notify Owner in writing of any repairs or alterations contemplated. Decorations include, but are not limited to, painting, wallpapering, hanging of murals or posters. Resident shall hold Owner harmless as to any mechanics lien recordation or proceeding caused by Resident.

8. Resident has inspected the premises, furnishings and equipment, and has found them to be satisfactory. All plumbing, heating and electrical systems are operative and deemed satisfactory.

9. Except as prohibited by law, Resident shall keep the premises and furniture, furnishings and appliances, if any, and fixtures which are rented for Residents exclusive use in good order and condition. Resident shall pay Owner for costs to repair, replace or rebuild any portion of the premises damaged by the Resident, Resident's guests or invitees. Resident's personal property is not insured by Owner.

10. Resident shall pay for all utilities, services and charges, if any, made payable by or predicated upon occupancy or Resident, except:

_____

11. The undersigned Resident(s), whether or not in actual possession of the premises, are jointly and severally liable for all obligations under this rental agreement, and shall indemnify owner for liability arising prior to the termination of the rental agreement for personal injuries or property damage caused or permitted by Resident(s), their guests and invitees. This does not waive "Owner's" duty of care to prevent personal injury or property damage where that duty is imposed by law.

12. Resident shall deposit with Owner, as a security deposit, the sum of $ _____,

payable _____ Owner may claim (withhold) of the security deposit only such amounts as are reasonably necessary to remedy tenant defaults as follows:

(a) in the payment of rent, or
(b) to repair damages to the premises caused by Resident, exclusive of ordinary wear and tear, or
(c) to clean such premises, if necessary, upon termination of the tenancy.

No later than two weeks (14 days) after the Resident has vacated the premises, the Owner shall furnish the Resident with an itemized written statement of the basis for, and the amount of, any security received and the disposition of such security and shall return any remaining portion of such security to the Residents.

13. If any legal action or proceeding be brought by either party to enforce any part of this Agreement, the prevailing party shall recover, in addition to all other relief, reasonable attorney's fees and costs.

14. Notice upon Owner may be served upon: _____

at: _____, CA.
Said person is authorized to accept legal service on behalf of Owner.

15. No portion of said premises shall be sublet nor this Agreement assigned. Any attempted subletting or assignment by the Resident, at the election of Owner, shall be an irremedial breach of this Agreement.

IF APPLICABLE:

A. House Rules: By initialing as provided, Resident acknowledges receipt of a copy of house rules, and has read them, a copy of which is attached hereto, marked as page _____, and are incorporated herein by reference as though fully set forth at length. Said house rules shall be deemed covenants of this agreement.
Initial_____

B. Inventory: By initialing as hereinafter provided, Resident acknowledges the subject premises are furnished in accordance with the attached inventory and a copy thereof is attached hereto, marked page _____, and is incorporated herein as though fully set forth at length.
Initial_____

C. Addendum: By initialing as provided, Resident acknowledges that additional terms and provisions have been agreed upon which are designated as an Addendum, a copy of which is attached hereto, marked page _____, and is incorporated herein as though fully set forth at length.
Initial_____

The undersigned Resident acknowledges having read and understood the foregoing, and receipt of a duplicate original.

_____ OWNER	_____ RESIDENT
_____ BY AUTHORIZED AGENT	_____ RESIDENT
	_____ RESIDENT

Sacramento County
Shasta County
Tehama County
Yolo County
Yuba County

SVAA

Apt # / Location

CHECK IN - CHECK OUT

This Check In - Check Out form is for your protection as well as ours. Please take the time to go through your rental and note the condition. Under California Civil Code 1950.5 your deposit is refundable only if there is no cleaning and/or damage beyond normal wear and tear, and no unpaid rent. The deposit disposition will be mailed to you within 14 days, using the form on the reverse side.

	IN	CONDITION	OUT
KITCHEN			
Walls			
Floor			
Ceiling			
Range			
Exhaust Fan			
Refrigerator			
Sink			
Cupboard			
Disposal			
Electrical Outlets			
Other			
BATHROOM			
Shower			
Tub			
Sink			
Toilet			
Closet/Cupboards			
Faucets			
Towel Rack			
Walls			
Ceiling			
Floor			
Other			
LIVING ROOM			
Carpet			
Walls			
Ceiling			
Doors			
Windows			
Drapes			
Electrical Outlets			
Other			

BEDROOM(S)	IN	#1	OUT	IN	#2	OUT
Doors						
Closets						
Carpet						
Windows						
Walls						
Ceiling						
Electrical Outlets						
Drapes						
Other						

Code (s) satisfactory (us) unsatisfactory-please explain

Resident _____ Signed

Resident _____ Signed

Date: _____ Received By: _____ Date: _____

SVAA S-7 84

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APPLICATION FOR SELF HELP GRANT

NAME: SAN QUANG TRAN

ADDRESS: 7301 FLORINWOOD Dr #34
Sacramento, CA 95823

PHONE NUMBER: (H)(916) 395-1327 (MESSAGE) N/A

AGE: 31 YRS

INDIVIDUAL/FAMILY INCOME SOURCE: AFDC AMT.$ 69?

PREVIOUS WORK HISTORY: Worked as a cook in San Francisco, CA

POSITION: Cook COMPANY: Portic Recipe

EMPLOYED FROM: _____ TO _____ COMPANY ADDRESS: Restaurant 230 Clay St San Francisco

REASON FOR LEAVING: I moved to leave in Sacto

COMPANY PHONE #: _____

POSITION: _____ COMPANY: _____

EMPLOYED FROM: _____ TO _____ COMPANY ADDRESS: _____

REASON FOR LEAVING: _____

COMPANY PHONE #: _____

POSITION: _____ COMPANY: _____

EMPLOYED FROM: _____ TO _____ COMPANY ADDRESS: _____

REASON FOR LEAVING: _____

Are you job training certified: N/A

State which Training Program you are registered: N/A

How are you preparing yourself for future employment?

I am currently enrolled in a ROP Property Managensent and Maintenance Class

How will you use this grant? (Please attach proof of need, i.e., estimate of bill for tools, car repairs, description of clothing to be purchased, etc.)

1. Craftsman 3/8" drive standard socket set w/ratchet and deep sockets 34.99 - Craftsman electric drill and drill bit set. Rip saw and crosscut saw.

Attach a letter of reference to this application from your training program operator, future employer, teacher, religious leader, etc. which addresses and verifies your need and your efforts to gain employment.

I certify that the requested information is correct and true and hereby give permission for this information to be verified. I agree to participate in an interview on January 16, 1987 and to attend the Job Fair.

Signed: [signature] Date: 12-04-86

This must be mailed or delivered to MLK Expo Job Fair c/o Asian Resources, 2251 Florin Rd., Ste. E, Sacramento, CA 95822 by January 9, 1987, 5 p.m.

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TESTS

PROPERTY MANAGEMENT AND MAINTENANCE
Unit 18 Dialogue

Write dialogue on board. Students copy.

HELLO, or GOOD MORNING. My name is Ung Tran.

I am calling about the Assistant Manager position.

Where is the apartment?

What is the salary?

Are there any benefits?

What type of work is involved?

Is it OK if I have children?

Where can I get an application?

May I ask your name?

Thank you for your help. Good Bye.

APPENDIX

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PROPERTY MANAGEMENT & MAINTENANCE
Vocational Education Department
Sacramento City Unified School District
David LaRash, Instructor

Legend:
1 Skill Complete
2 Skill Needs Improvement
3 Skill Incomplete

Hand Tools	Safety 1	2	3	Operation 1	2	3	Maintenance 1	2	3
Hammer									
Screwdriver									
Chisel									
Block Plane									
Combination Square									
Flexible Tape									
Brace & Bit									
Hand Saw									
Vice									
Level									

Portable Power Tools	Safety 1	2	3	Operation 1	2	3	Maintenance 1	2	3
Electric Drill									
Drill Bits									
Belt Sander									
Orbital Sander									
Saber Saw									
Router									
Circular Saw									

Stationary Power Tools	Safety 1	2	3	Operation 1	2	3	Maintenance 1	2	3
Table Saw									
Radial Arm Saw									
Grinder									
Jigsaw									

Tractor	Safety 1	2	3	Operation 1	2	3	Maintenance 1	2	3
Mower									
Tiller									
Disc									

Riding Mower	Safety 1	2	3	Operation 1	2	3	Maintenance 1	2	3
Mower									
Catcher									

Plumbing	Skills 1	2	3
Repairing Leaky Faucet			
Toilet Tank Repairs			
Clearing Clogged Drains			
Soldering			

Plaster & Drywall	Skills 1	2	3
Crack Repair			
Small Hole Repair			
Large Hole Repair			

Paint	Skills 1	2	3
Types			
Brushes			
Rollers			
Ladders			
Estimating			

Floors	Skills 1	2	3
Wood Refinishing			
Linoleum Repair			
Carpet Installation			

Fasteners	Skills 1	2	3
Nail Identification			
Screw Identification			
Wall Fasteners			
Misc. Identification			

Doors	Skills 1	2	3
Types			
Common Problems			
Sliding Door Repair			
Bifold Door Repair			
Locks			

Windows	Skills 1	2	3
Types			
Double Hung Repair			
Casement Repair			
Sliding Repair			
Window Pane Repair			

Cement & Tile	Skills 1	2	3
Resetting Tile			
Caulking			
Repairing Cracks & Holes			
Patching Stucco			

Fertilizer	Skills 1	2	3
Types			
Analysis			
Application			

Pruning	Skills 1	2	3
Trees			
Shrubs			
Ground Covers			
Vines			

Identification	Skills 1	2	3
Plants			
Grasses			
Weeds			
Insects			

Heating	Skills 1	2	3
Types			
Filters			

Electrical	Skills 1	2	3
Lights			
Door Bell			
Outlets			
Wiring			

Propagation	Skills 1	2	3
Seed			
Cutting			

Roofs	Skills 1	2	3
Types			
Repair Leaky Roof			
Application Of Caulking			

Job Skills	Skills 1	2	3
Application			
Resumé			
Appearance			
Speech			
Reading			
Writing			
Attendance			
Manners			
Relates To Others			

Student Name: _____
ROP Class Site: _____
Job Training Site: _____
Date Of Graduation: _____